

*CLIENT/SERVER  
MARKETS & APPLICATIONS  
PROGRAM*

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# CLIENT / SERVER MARKETS & APPLICATIONS PROGRAM

INPUT®

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## COMPANY PROFILE: Digital Equipment Corporation

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The following profile outlines the products, services, and support offered by Digital Equipment Corporation to their clients for the implementation of downsizing, client/server and other distributed computing strategies.

### 1. Description of Principal Business

Digital Equipment Corporation (Digital) is one of the world's leading vendors of stand-alone and networked computer systems, software, and services. Digital offers a wide range of hardware and software solutions for interactive, distributed and multi-vendor information systems environments, including desktop, client/server and mainframe systems. The company's business strategy is focused upon recognizing the dynamic nature of the information systems marketplace and helping its customers adapt and prosper in the face of changing technologies and competi-

tive environments. Digital is also a global vendor, with over 50% of its fiscal 1992 revenues generated from product development, manufacturing and customer services in the Americas, Europe, Asia and the Pacific Rim. The company currently has over 98,000 employees who develop, market, and install applications including transaction processing, data management, system and network management, telecommunications, finance, real-time data acquisition and control, vector processing, and high-performance technical computing. Exhibit 1 provides an overview of Digital's overall financial performance for the last several years.

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Exhibit 2 provides a graphic representation of the services Digital provides in various vertical industries.

## 2. Strategy for Supporting Client/Server Requirements

Digital's philosophical approach to its business, including downsizing and client/server projects, is based upon the company's

Exhibit 1

### Overall Financial Performance

Cost and Expense	1992 (\$ Millions)	1991 (\$ Millions)	1990 (\$ Millions)
Contract Revenue	13,930.9	13,911.0	12,942.5
Interest Revenue	96.1	113.2	142.0
Costs and Expenses	16,066.5	14,499.3	12,929.9
Income Before Taxes	(2,078.0)	(519.7)	124.0
Estimated Income Taxes	232.0	97.7	49.6
Net Income	(2,795.5)	(617.4)	74.4

Exhibit 2

### Primary Offerings by Industry Group Digital Equipment Corporation

	SI Services	Outsourcing Processing Services	Apps. Software Turnkey Systems	Network Services	Systems Software	Desktop/ Client/ Server
Discrete Manufacturing	X	X	X	X	X	X
Process Manufacturing	X	X	X	X	X	X
Transportation	X	X		X	X	X
Utilities	X	X	X	X	X	X
Telecommunications	X	X	X	X	X	X
Retail Distribution	X	X		X	X	X
Wholesale Distribution	X	X		X	X	X
Insurance	X	X		X	X	X
Medical/Health	X	X	X	X	X	X
Education	X	X		X	X	X
Business Services	X	X	X	X	X	X
Federal Government	X	X	X	X	X	X
State/Local Government	X	X	X	X	X	X
Banking/Finance	X	X	X	X	X	X

dictum that a strategic advantage in business is never achieved by information technology alone. Digital breaks the client equation into three distinct components which the company believes must be considered and integrated for the client to receive the greatest benefit. They are as follows:

- Business, which is affected by business process re-engineering, investment and risk management, and information architecture
- People, who are affected by change management, organizational design, and knowledge management
- Technology, which includes systems integration, capacity planning, application design, outsourcing, operations management, end-user computing, and multi-vendor services

After years of providing information technology systems in a multitude of industries, Digital believes that technology can suffer from obsolete business procedures and processes, while the business can decline if a company's technical expertise is under- or over-estimated. In computer downsizing and client/server, Digital also has three components to their strategy:

- *Re-hosting* - Digital defines this as the migration of existing application environments to new platforms to provide cost reduction and performance improvements. For example, applications can be rehosted from a mainframe to a Digital AXP Alpha OpenVMS or DEC OSF/1 platform, which the company believes will offer lower-cost computing while minimizing risk.
- *Re-architecting* - This segment of Digital's strategy focuses on the advantages and disadvantages of the currently available alternative computing infrastructures. By redesigning a client's information technology environment,

Digital believes business process can be more effective through improvements in productivity, ease-of-use, flexibility, and operation costs. Through consulting and analysis, Digital focuses on helping customers with mainframe environments move to distributed, client/server environments to improve computing and cost performance. In this process, Digital views cost justification as a critical element in the sales process.

- *Re-engineering* - Digital helps clients transform their core business processes in order to perform and respond better in the client's changing competitive environment. Digital's practical approach focuses on modifying the basic design of a client's organization and redefining the business process which affect the competitive directions and decisions a company follows.

DEC has been developing strategies for clients interested in computer downsizing for many years, but formally established its Computer Downsizing Group in December, 1991. The role of this group is to incorporate all of Digital's products and service groups, including third parties.

### 3. Scope of Current Client/Server Related Activities

Digital estimates that downsizing or client/server technology is a component of nearly every industry and delivery mode segment in which the company operates. Although the company could not provide specific revenue, research and development, and personnel figures for its computer downsizing-related activities, Digital does estimate that downsized, distributed, and client/server computing are a substantial portion of most of its current and planned contracts.

#### 4. Client/Server Products and Services

Although known historically as a leading manufacturer and vendor of information technology hardware systems, Digital has evolved and widened its product offerings to include not only hardware, but also the consulting and services expertise clients now require to manage new and emerging technology. Digital's computer downsizing products and services focus primarily on infrastructure, applications, software products, conversion, and re-engineering and are targeted at end-users, CIOs, CFOs, department managers, and division managers. In most cases, Digital acts as the prime contractor on computer downsizing and client/server contracts, but the company will team with other companies, or act as a subcontractor, if such an arrangement can add profitability and value for the customer. Digital also brings in alliance partners on a free and open basis. In most cases, Digital's capabilities are applicable not only to computer downsizing and client/server, but to customers in all the information technology markets the company serves.

- **Consulting** - Digital offers business management and information technology consulting, which is designed to assist customers with everything from overall business planning to hardware selection. As consultants, the company helps customers with change management and the assessment of information technology architecture, application conversion and re-engineering, application migration, and technology restructuring. Digital's consulting experience extends to all hardware and software technologies, including IBM, Unisys, Wang, Apple, Hewlett-Packard, Novell, Microsoft and Digital. In addition, the company has consulting alliances with such major players as Andersen Consulting, Computer Sciences Corporation, and Keane, Inc.

- **Professional Services** - After consulting, Digital helps clients with the practical matters of managing information technology. These include applications migration and development, and customized systems. In addition, Digital also performs modular outsourcing services across nearly every architecture in the information technology pantheon. The company also provides systems integration, which it has applied in numerous multi-platform environments, including those that have been downsized or migrated.
- **Multi-vendor Hardware and Software Support** - Digital supports and migrates applications in a wide variety of environments, from its own VAX VMS and OpenVMS systems to IBM OS/2, MS-DOS, UNIX, XENIX, Microsoft Windows, and Windows NT. Digital has in fact made an enthusiastic commitment to NT, which will run on the company's expanding line of Alpha AXP-based PC platforms. Overall, the company supports and services more than 14,000 products from over 1,300 companies world-wide, including approximately 80% of the most commonly used desktop applications.

The company's newest hardware offerings center around the Alpha AXP Systems platform. Alpha AXP is Digital's 64-bit, DECchip 21064-based systems environment which includes PCs, workstations, midrange systems and mainframe-sized servers. The Alpha AXP environment is designed as an open systems architecture and encompasses the elements Digital has defined for open systems:

- Interoperability among applications, systems, and networks
- Integration with existing hardware and software
- Scalable deployment, which allows for computer downsizing and client/server



- Applications which are easily portable among hardware platforms
- Graphical user interfaces (GUIs) which look and operate the same regardless of platform
- Systems integration operability for a multi-vendor environment

Digital utilizes and integrates these products and services in a broad range of industries and business functions, including those entering the growing computer downsizing and client/server market.

### 5. Recent Client/Server Engagements/Contracts

Digital has put its downsizing and client/server services and strategies to practical use for numerous clients. Three of the company's most recent downsizing and client/server contracts are presented below.

- **Pitney Bowes, Inc.** - This leading mailroom systems and services vendor enlisted Digital's help in order to improve both the quality and the time-to-market for new products and thus improve its competitiveness. The goal is to create a paperless information flow between Pitney Bowes' development, manufacturing and materials groups and to speed the product development cycle by at least 50%.

To achieve this, Pitney Bowes has connected its engineering and manufacturing groups on a client/server network, utilizing an Open Software Foundation (OSF) UNIX environment and Digital Alpha AXP computers for both desktop clients and stand-alone servers. Pitney Bowes is also using Digital's Athena Services to manage the multi-vendor hardware and software environment that still exists.

Pitney Bowes plans to extend this client/server system enterprise-wide by 1994, when it will include the company's entire set of supply functions, including order entry, customer

tracking, inbound and outbound logistics, and service operations. To date, Pitney Bowes engineers have cut the design cycle for many of the company's products from six weeks to three days by utilizing Parametric Technology's PRO-Engineer 3-D CAD system running on DECstation 5000-240 workstations on the client/server network. This Digital-based client/server system has been in implementation for roughly one year.

- **Libbey-Owens-Ford Company** - Since 1988, this company's Auto Glass Replacement (AGR) Business Unit has opened 69 service centers and plans to have 100 in place by the end of this year. When this is done, the AGR unit will have a continent-wide service network which will provide supplies to local auto glass replacement shops all over the United States and Canada.

With a view toward establishing this network, the AGR unit has moved its in-house applications development efforts from an IBM mainframe to a Digital client/server environment which provides nation-wide, distributed real-time inventory management utilizing the Digital Rdb relational data base system. The client/server network Digital has provided connects the AGR unit's service centers, supply depots and unit headquarters and distributes the unit's real-time inventory control system, integrated resource planning system and order processing system among all service centers. By the end of this year, all of the AGR unit's VAX 4000 field office servers will be linked to an Alpha AXP-compatible VAX 6620 system at unit headquarters.

As a result of this client/server strategy, the AGR unit believes it will be better able to provide customer service and quick responses for inventory, while Digital estimates that this system will reduce the unit's information technology expenditures by \$1 million in 1993.

- **Keyport Life Insurance Company** - After this company was acquired by Liberty Financial Services, Inc., it had to migrate its financial applications off the IBM 3090 mainframe it formerly used to a new system.

The company wanted to retain use of the Millennium applications package from Dun & Bradstreet Software, Inc., but decided to migrate the applications system to a Digital VAX 6000 mid-range. By retaining the D&B software and purchasing the VAX, Keyport re-

tained the functionality of its applications, and saved money with the lower-cost Digital computer.

In addition to these case studies, Exhibit 3 provides a brief summary of other major DEC downsizing and client/server customers.

## 6. Future Plans

Digital has described itself as a worldwide supplier of networked computer systems, software,

Exhibit 3

### Major Downsizing Customers Digital Equipment Corporation

Company	Project Description	Vendor Involvement
Yamaha	As a result of growing competition in the large scale integration (LSI) semiconductor chip market, Yamaha enlisted DEC's aid in formulating plans for the purchase and implementation of high-quality LSI design systems and a fast time-to-market production system, both needed in order to increase Yamaha's LSI market share.	DEC consultants worked with Yamaha to develop a 2-year plan for the re-design of the company's LSI design process and the creation of an enterprise-wide information technology environment to support current and future applications. Client/server computing methodologies are part of the plan.
Compania Espanola de Petroleos S.A. (CEPSA)	CEPSA, Spain's largest private petrochemical firm, sought assistance from DEC to plan an information technology environment which will help the oil company grow and compete with domestic and foreign competitors in the European Economic Community.	DEC helped CEPSA formulate strategic information technology goals, including downsizing and client/server computing, which will reduce costs and improve functionality in the Spanish company's business processes, thereby improving its competitive capabilities.



and services that consults in all industries to bring business, people and technology together. This fits with the evolution Digital has undergone from being a computer design and manufacturing company to being a business and information technology solutions company.

The company has every intention of continuing this evolutionary journey. With the trend toward downsized and client/server solutions firmly, if hazily, entrenched in the information technology infrastructure, Digital has committed itself to open systems and enterprise computing not only from a nuts-and-bolts perspective, with its Alpha AXP systems architecture, but also from a managed business solutions perspective. The company believes the marriage of its technical products and experience with its consulting and professional services expertise forms a good combination that will further the needs and goals of its downsizing and client/server customers.

## 7. Overall Assessment

After revolutionizing computing in the '60s and '70s with the minicomputer, Digital spent much of the '80s in a holding pattern which formed when the company downplayed the importance of the personal computer in favor of its core business, midrange systems. Although the last decade was a profitable one, Digital entered the '90s in a shaky position where PCs and desktop systems were concerned. This has contributed in some measure to the company's declining profits in recent years.

However, this disappointing period in Digital's recent history may be coming to an end. In December, 1992 the company segmented into four customer service-oriented business units and five product and service-oriented business units. The company believes this segmentation will enable it to better serve its different customer groups and more effectively market and support its wide range of products and services.

As for products, Digital has made a bold move with the development and introduction of the Alpha AXP chip and the systems which are based upon it. The company is betting that its 64-bit superchip will become an industry standard for mid-range and PC-based client/server systems. Digital has the support of Microsoft and Windows NT, which will run on Alpha AXP systems, including the Alpha AXP PCs Digital introduced in late May, 1993.

The moves Digital has made indicate a company that has recognized the need for change. Although the company still has a huge installed customer base, these changes should pave the way for greater opportunity in the future. In client/server, Digital has both the services and product experience necessary to continue as a major influence on, and vendor of, these trends and technologies.

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## COMPANY PROFILE: Electronic Data Systems Corporation

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The following profile outlines the products, services, and support offered by Electronic Data Systems Corporation to their clients for the implementation of downsizing, client/server, and other distributed computing strategies.

### 1. Description of Principal Business

Electronic Data Systems Corporation (EDS) is a leading information and communications services company which provides information processing, consulting, systems management, systems integration, and communications services to a wide variety of industries. Founded in 1962, EDS currently has over 71,000 employees and operates in more than 30 countries. The company was acquired by General Motors Corporation in 1984 and operates as an independent subsidiary of GM, which is EDS's largest customer. Exhibit 1 provides an overview of EDS' overall financial performance for the last several years. Exhibit 2 provides a graphic representation of the services EDS provides in various vertical industries.

### 2. Strategy for Supporting Client/Server Requirements

EDS has made a concerted effort to clearly define both the technologies utilized in the information services industry and its corporate view of these technologies. EDS's corporate strategic direction encompasses architectures, networks, platforms, and methodologies and is based on the open systems and client/server model of computing, which EDS believes provides both the standards and the flexibility required to meet the needs of individual customers. EDS's policy views have been derived from over 30 years' experience in the information services industry and from ongoing analyses of industry trends and studies of industry direction.

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EDS currently defines client/server computing in terms of three major functional components:

- **Presentation function** – EDS defines this as what the user sees and what they interact with, and the function that accepts and validates data entry and displays results.

**Exhibit 1**  
**Overall Financial Performance**  
**Electronic Data Systems**

Cost and Expense	1992 (\$ Millions)	1991 (\$ Millions)	1990 (\$ Millions)
Contract Revenue	8,155.2	7,028.5	6,021.7
Interest Revenue	63.7	70.5	87.1
Costs and Expenses	7,218.1	6,205.3	5,320.1
Income Before Taxes	1,000.8	893.7	788.7
Estimated Income Taxes	365.3	330.7	291.8
Net Income	635.5	563.0	496.9

**Exhibit 2**

**Primary Offerings by Industry Group**  
**Electronic Data Systems**

	SI Services	Outsourcing Processing Services	Apps. Software Turnkey Systems	Network Services	Systems Software	Desktop/ Client/ Server
Discrete Manufacturing	X	X	X	X		X
Process Manufacturing	X	X	X	X		X
Transportation	X	X		X		X
Utilities	X	X	X	X		X
Telecommunications	X	X		X		X
Retail Distribution	X	X		X		X
Wholesale Distribution	X	X		X		X
Insurance	X	X		X		X
Medical/Health	X	X	X	X		X
Education	X	X		X		X
Business Services	X	X		X		X
Federal Government	X	X		X		X
State/Local Government	X	X		X		X
Banking/Finance	X	X	X	X		X

EDS does not consider the graphical user interface (GUI) inherent in defining client/server, but stipulates that the GUI is the most common form of presentation.

- *Application function* – EDS defines this as the function which performs data manipulation and calculation.
- *Data management function* – EDS defines this as the function which manages access to data files or data bases, coordinates user requests for data, and ensures data integrity and security.

EDS also defines client/server computing in terms of the following six views:

- Distributed presentation
- Remote presentation
- Remote data management
- Distributed function
- Distributed data base
- Distributed process.

According to the company technology policy, these six views are distinguished by both the division and placement of the presentation, application function, and data management components across various client/server platforms. The EDS view assumes that client/server systems are network-based and that a given component can reside entirely upon the server or the client, or can be split between the two depending upon user needs.

EDS believes that applications utilized in a client/server environment provide for flexible use of an application's functions throughout a network. This flexibility, used in a high-power server environment, can provide EDS customers with more cost-effective information technology solutions. Ultimately, the EDS view states that client/server methodologies can facilitate business re-engineering and boost competitiveness

through more effective use of information technology in business problems.

In late 1991, EDS introduced the EDS RightStep program, which is an EDS-developed process designed to help their clients define and target the most desirable platforms, methodologies, and distributed computing environments for a downsizing or client/server migration. During the RightStep process, EDS helps clients plan their enterprise technology goals, define the client's desired applications architecture, and plan the actual architecture migration. The final stage of the RightStep process is the actual migration to a downsized or client/server environment.

EDS has targeted its RightStep program toward chief information officers, chief financial officers and user department managers. Its primary focus is multi-faceted and includes downsized or client/server-based infrastructure, applications, software products, conversion, and re-engineering needs. Typically, EDS acts as the primary contractor for downsizing or client/server projects, although the company will form alliance partnerships in individual cases where platform specifications require the assistance of a major hardware vendor.

### **3. Scope of Current Client/Server Related Activities**

EDS estimates that downsizing or client/server technology is a part of nearly every industry and delivery mode segment in which the company does business. Although the company would not provide specific revenue, research, development, and personnel figures for its downsizing-related activities, EDS does state that distributed and client/server computing is a substantial portion of most of its current and planned contracts.

#### 4. Client/Server Products and Services

EDS offers a myriad of capabilities for client/server and other downsizing methodology goals. In most cases, EDS capabilities are applicable not only to client/server or downsizing clients, but to customers in every information technology area EDS serves.

- **Consulting** – EDS offers consulting services for overall business planning and architecture and applications planning. For planning, EDS addresses a client company's overall mission, its objectives, the key factors for its success, strategies for achieving success, and the measures necessary to achieve and maintain a competitive advantage. EDS also consults on business process design, which identifies the best methods for organizing the applications and activities to support corporate goals. In technology, EDS helps clients define the technological environment required for success. These include the identification of information requirements and existing capabilities and performance, and the development of further strategies and opportunities to leverage information technology resources, including client/server architectures and applications.
- **Professional/Systems Services** – In addition to consulting, EDS's professional services include systems integration, development, and management. EDS works closely with customers to determine how information technology can support their business objectives. Based on this determination, the resulting solution can be the development of new applications, integration of applications and their supporting software/hardware, and management and operation of the entire information technology solution. EDS' systems integration, development, and management knowledge and experience all encompass client/server computing. By deploying applications that use graphical and

multimedia user interfaces and that distribute application functions and data management between clients and servers, EDS helps customers implement new business processes and gain access to organizational information.

- EDS also has strong outsourcing experience. Through the company's network of Information Processing Centers (IPCs), EDS can manage the operation, maintenance and enhancement of a client's computing, communications, applications, and data requirements. EDS is also adept at managing business processes within an organization, often by developing interfaces and related functions and applications to assure efficient operation.

EDS services apply to a broad range of industries, business functions and platforms.

#### 5. Recent Client/Server Engagements/Contracts

EDS has put its downsizing and client/server services and strategies to practical use for numerous clients. Three of the company's most recent downsizing and client/server contracts are presented below.

- **Marine Spill Response Corporation (MSRC)**  
– The United States petroleum industry funds the MSRC, an organization formed for the development and coordination of more effective methods to respond to oil spills. The MSRC also helps clients meet requirements of the Oil Pollution Act of 1990 (OPA90), which mandates that oil transportation companies have spill response capability. To respond as rapidly as possible to an oil spill and the ensuing clean-up operation, the MSRC required an information system which could change quickly from a steady-state operational mode to a spill response mode requiring greatly elevated information processing levels.



EDS developed a client/server network solution which established Apple Macintosh workstations as clients hosted through a GUI by a variety of platforms and applications within the MSRC automation infrastructure. MSRC's primary application, the Spill Operations System, resides on an IBM 3090 mainframe, which acts as both a DB2 data base server and an application server. Sun UNIX servers also provide distributed geographical information system (GIS) data and applications using an Oracle Corporation data base. In addition, servers provide Macintosh client access to a Business Operations System, which includes general ledger, accounts payable, fixed asset and procurement applications. The business system provides client/server access through DB2 files, VSAM files and CICS on-line transactions processing.

EDS also established a multiprotocol wide-area network (WAN) which connects MSRC headquarters in Washington, D.C. with five regional MSRC sites, mobile command units and spill response vehicles through leased lines and satellite transmission pathways.

- **Idaho Title XIX Account** – As a first step in a migration plan toward open systems and client/server, the Idaho Title XIX Account conducted a pilot program to demonstrate that downsizing the EDS Medicaid System would reduce operating expenses and produce more cost-effective operations. This potentially affords EDS an opportunity to provide Medicaid services in smaller states, where the company could not previously provide cost-effective solutions.

Over three months, EDS migrated the previously outsourced Idaho Medicaid system from an EDS Information Processing Center (IPC) mainframe to a Sun 630 UNIX server. EDS utilized VISystem's VIS/TP, a CICS emulation

system, to downsize 48 on-line applications and 37 VSAM files. EDS engineers also used a COBOL application to migrate 61 batch programs to the new system.

As a result of this migration, Idaho Medicaid has its application server on-site, which has greatly improved on-line response time. The system also currently allows users cost-effectively to run batch processing jobs on an as-needed basis, rather than weekly. Finally, an EDS-provided GUI has improved the productivity of systems engineers by making workstation applications easier to use through better integration with electronic mail and word processing packages.

- **1992 Barcelona Olympics** – EDS was awarded the contract to provide a real-time information technology system for the Barcelona Olympics in December, 1989. After over two years of development, EDS provided an integrated hardware and software system which stored and displayed the on-going results for all 34 Olympic sporting events.

EDS utilized two IBM ES/9000 mainframes and 3,800 PS/2s to form 50 autonomous token-ring local area networks (LANs) which were located at each sporting venue. For each LAN, the PCs served as data entry terminals or as output terminals for interfaces between computer displays, scoreboards, and printers. A single PC on each network connected the LAN to the International Broadcasting Center, while two more PCs on each LAN were connected to the ES/9000s, which acted as DB2 data base servers.

Results entered into any of the data entry PS/2s were instantly relayed to the other networked computers through EDS's custom message handling system. Data entry terminals could also relay messages to any terminal or group of terminals on the network. The output PCs on

each LAN relayed event results to both the International Broadcasting Center and the ES/9000 mainframes. The mainframes in turn relayed event results to numerous press networks and broadcast locations. In total, the EDS network provided sporting results an average of three seconds after they were entered to over 2,200 locations in Barcelona and to over 3.5 billion television viewers throughout the world.

In addition to these case studies, Exhibit 3 provides a brief summary of other major EDS downsizing and client/server customers:

### **6. Future Plans**

EDS intends to be the defining entity for the information technology industry. To this end, the company believes the power of client/server allows it to support customers who want to make the transition from transaction-based processing to business event and knowledge-based systems solutions. EDS believes this transition can be achieved by applying new technologies, such as GUIs, multimedia and imaging, in a cost-effective manner on the enterprise level.

Although EDS has extensive client/server knowledge and experience, the company concedes that the technology itself is still developing and is, in many cases, still nebulous and underdefined. The EDS view is that the information systems industry accepts the concept of downsizing and client/server but does not fully understand the full impact these technological methods present. The company believes its task is to increase its client/server knowledge and experience, while leveraging its mainframe expertise, so that it can further enhance its skill and service offerings in this technology area.

### **7. Overall Assessment**

EDS has positioned itself in the downsizing and client/server market as well as it did previously in facilities management, systems integration and outsourcing. Due to the company's multi-platform and multi-application expertise, it offers understanding of both the problems and solutions associated with its clients' information technology desires. In downsizing and client/server markets, EDS realizes both the overall concepts and the underlying ramifications of migrating from old technology and introducing new technology.

Exhibit 3

### Major Downsizing Customers Electronic Data Systems

Company	Project Description	Vendor Involvement
ACR Rochester Division (ACR) (Combination of former AC Spark Plug, AC Diesel & Rochester Products Divisions of General Motors)	A project designed to reduce ACR's 337 existing systems to 176 systems. ACR will convert and migrate many of these systems from current Burroughs/UNISYS hardware to an IBM environment. Wherever possible, the new systems will conform to current General Motors information management guidelines.	EDS is working with ACR to develop the Information Planning and Consolidation Target (IMPACT) to meet project goals. In addition to systems downsizing, IMPACT will reconfigure ACR's business technology to increase market competitiveness.
Harvard Community Health Plan (HCHP)	In order to improve health care management, HCHP wanted to improve the outdated technology it used for managing patient medical records. With EDS, HCHP formed InterPractice Systems INC. (IPS) in 1991 in order to develop a clinical information system which would address technological needs and focus on automated medical records as a key component.	EDS provided a client/server solution based on a DEC VAX server using the INGRES data base which acts as a host to Macintosh workstations. The terminals are connected through an EtherNet LAN and access patient records through a true client/server GUI environment, which improves report speed and accuracy.
Los Angeles County Department of Public Social Services (DPSS)	LA County's General Relief Program is administered from 14 county offices and handles more than 70,000 cases per month. To deter applicant fraud and abuse, DPSS needed an automated system to replace the manual fingerprint matching system it used for applicant identification.	EDS is developing the AFIRM system as the focus of a five-year contract with DPSS. Currently, AFIRM allows county clerks to search an Informix data base for digitized applicant fingerprints using Hewlett-Packard client/server hardware.

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# Company Profile

A Publication from INPUT's Client/Server Software Program

February 1994

## Digital Equipment Corporation

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The following profile outlines the products, services, and support offered by Digital Equipment Corporation to their clients for the implementation of client/server other distributed computing strategies.

### ***1. Description of Principal Business***

Digital Equipment Corporation (Digital) is one of the world's leading vendors of stand-alone and networked computer systems, software, and services. During the last several years, the company has been in the process of reinventing itself in order to become more competitive in the rapidly changing technological landscape. Although Digital offers a wide range of hardware and software solutions which address virtually every need in the

systems marketplace, the company has made client/server computing its single, overriding business focus. After realigning structurally into nine industry- and service-oriented business units in late 1992, Digital made a landmark announcement in late 1993 where the company formally introduced over 150 new, or upgraded, products and services specifically aimed at the client/server market. The company has planned more announcements for 1994 as part of a continuing strategy to create or upgrade client/server products and services.

Digital's commitment to client/server computing holds true to the company's fundamental business strategy, which is to focus upon recognizing the dynamic nature of the information systems marketplace and help its customers adapt and prosper in the face of changing technology and increased competition. The company has utilized this strategy globally, as over 75% of Digital's fiscal 1993 revenues derived from product development, manufacturing, and customer services in Asia, Europe, Latin America, the Pacific Rim, and other regions outside the U.S. During the 1993 fiscal year, Digital trimmed its total number of employees from 113,800 to just over 94,000. Exhibit 1 provides an overview of Digital's overall financial performance for the last several years.

## 2. Strategy for Supporting Client/Server Requirements

Macroscopically, Digital defines its strategic approach in the form of three principles:

- *Providing "No Compromise" client/server technology* - Digital has developed several methods of offering customers what the company believes is the most up-to-date, cutting-edge client server technology. For example, through collaborations with such companies as The ASK Group, Cincom, Cyborg Systems, Inc., Gupta Corporation, Oracle Corporation, Ross Systems, SAP, Sybase and WordPerfect, Digital has a substantial portfolio of applications and third-party support

Exhibit 1

### Overall Financial Performance Digital Equipment Corporation

Revenues	1993 (\$ Millions)	1992 (\$ Millions)	1991 (\$ Millions)
Product Revenue	7,588	7,696	8,299
Services/Other Revenue	6,783	6,235	5,612
Costs and Expenses	14,608	16,067	14,499
Income (Loss) before Taxes	(224)	(2,078)	(520)
Provision (Benefit) for Taxes	27	232	97
Net Income (Loss)	(251)	(2,796)	(617)



available to meet numerous and varied customer needs. To date, over 3,000 third-party applications have been ported to Digital's Alpha AXP platform, which is described in Section 4, *Client/Server Products and Services*.

Digital is able to provide integrated third-party applications through its Open Software Framework strategy. With this strategy, the company provides enabling software tools that allow customer systems to utilize disparate Digital and third-party applications in an integrated client/server architecture. The underlying principle for this is Digital's stated commitment to provide customers with applications chosen from independent software vendors while giving the user an integrated solution at the individual desktop. Digital's products in the Open Software Framework include LinkWorks, the PATHWORKS product group, ACCESSWORKS and OBJECTbroker. These are described in Section 4.

- *Focusing on customer business needs* - In July 1993, the company organized itself into nine business units which address the following markets: personal computers; data storage, components and peripherals, financial, professional and public services, discrete manufacturing and defense, consumer, process, transportation, communications, education and media, health industries and multivendor customer services. Through these business units, Digital leverages its

expertise within each industry and is also able to approach each potential customer as an individual case with requirements which may differ from comparable companies in a given industry. Through this approach, Digital has established industry-specific software frameworks which currently enhance its ability to quickly and effectively implement client/server solutions. Digital's philosophical approach to its client/server business is based upon the company's dictum that a strategic advantage in business is never achieved by information technology alone. The company believes that before it can offer a customer any form of client/server system, the company must fully understand the customer's business and the strategic goals for implementing new technology.

- *Build client/server consulting expertise* - As a strategic element, Digital draws heavily upon its historical experience designing, installing and supporting computer hardware and software systems. For example, the company currently estimates it has installed upwards of 100,000 computer networks linking over one million systems. Admittedly, much of this practical experience has been with Digital's own systems, but the company has amassed enough systems integration expertise to generate approximately \$2.3 billion in IS-related revenues during fiscal 1993. Digital is aggressively developing its client/server consulting practice based upon the expertise it has gained through

extensive multivendor hardware and software integration projects.

- *Leverage multivendor customer service expertise* - Although this has been a formal company strategy since 1983, Digital has provided multivendor support at varying levels for nearly 20 years. Today, the basis for this support is the design, implementation and management of heterogeneous, distributed systems for Digital customers. The company's key strategic focus here is to expand its ability to provide and support multivendor systems, even if those systems are not based on its technologies.

### **3. Scope of Current Client/Server Related Activities**

Currently, Digital's consulting practice can draw from over 7,000 employees dedicated to client/server and systems integration services. In addition, the company has over 2,000 business and technology consultants, nearly 3,000 UNIX system professionals and over 700 multivendor PC local area network (LAN) support personnel. These personnel, who operate largely in North America, make up part of the 35,000 systems support professionals the company employs globally. Digital operates at 450 locations in 100 countries and provides training in 18 languages, including French, German, Japanese and Spanish. Digital also operates 14 customer support centers and over 100 professional service centers.

Digital supports more than 14,000 various hardware and software products from nearly 1,400 vendors. Many of these vendors participate in Digital's Commercial Software Sale program, through which Digital customers can get a discount of up to 20% on third-party software. Some of these vendors and products include:

- Advanced Technology Services, the maker of Optidoc and other imaging software products.
- BSA Systems, which supplies a software product named GAINS for inventory planning, forecasting and distribution planning.
- CompuSoft, which provides software products for human resources, manufacturing and distribution.
- Ingres, a division of The ASK Group and maker of leading relational database products.
- PIXAR, the computer graphics arm of Lucasfilm, which makes RenderMan for the design and execution of complex graphic models and animated objects.
- Systems Analysis Corporation, which supplies a series of software modules for hospital, laboratory and physician information reporting systems.

#### 4. Client/Server Products and Services

As part of the October 1993 announcement, Digital introduced over 150 new hardware, software and service products. The major components in the company's new client/server-focused arsenal are described below:

##### Software

- *LinkWorks* - This product is an application integration framework designed for the delivery of both personal and group applications, thereby consolidating and streamlining business operations. LinkWorks creates a collaborative business process environment which eliminates the usual administrative tasks that can impede productivity. Basic components of the product include group management, administration and communications tools, including: conditional routing, network user interface, electronic approval, signature and initial application integration, object and document management, distribution, content-based retrieval and shared objects.

The product is scalable from small work groups to large departments, and can encompass an entire enterprise. Currently, LinkWorks supports: Microsoft Windows, Apple Macintosh and Motif clients, TCP/IP, OSI, DECnet networks and SCO UNIX, OSF/1, OpenVMS and ULTRIX servers.

- *PATHWORKS* - Introduced in 1986, PATHWORKS is Digital's premiere software product for enabling heterogeneous PCs and workstations on different LANs to share files and computing access, and exchange data. The latest version of PATHWORKS, 5.0, allows users to access data and other computing resources through a single platform, regardless of where the data or application reside, even if the source is on a different platform type or LAN.

On the client side, PATHWORKS supports Windows and Windows NT, DOS, OS/2 and Macintosh operating systems. Supported server systems include NT, OS/2, ULTRIX, DEC OSF/1, SCO UNIX and OpenVMS. In networking, the product supports Microsoft's LAN Manager, Novell NetWare, AppleShare and protocols such as IPX, AppleTalk and NetBEUI.

- *ObjectBroker* - This product is Digital's object-oriented software for integrating independently developed applications into a multivendor computing environment, and is targeted for application developers and systems integrators. ObjectBroker V2.5, the latest release, allows users to add to, and reuse, applications without recompiling or relinking and allows application deployment across an entire heterogeneous client/server system.

Currently, ObjectBroker supports the following systems: OpenVMS VAX and AXP, ULTRIX, SunOS; Windows, Windows NT AXP, Windows NT AXP, IBM AIX, HP-UX, Macintosh System 7, OS/1 AXP, DECnet, TCP/IP and Digital's PATHWORKS. In addition, ObjectBroker offers CORBA V1.1 compliance and distributed OLE support.

- *DEC SNA Peer Server V1.0* - Designed for Digital's Alpha AXP hardware platform, DEC SNA Peer Server provides peer-to-peer connectivity between IBM mainframes and AS/400s in an SNA environment within TCP/IP and DECnet networks. Fundamentally, this product allows users to integrate Digital and IBM systems and deploy client/server applications between both environments and access existing legacy systems. The Peer Server provides IBM connectivity by supporting SNA Node type 2.1. Another product, the DEC SNA Domain Gateway V1.1, provides connectivity between IBM mainframes in a SNA environment and Digital systems in a DECnet system. It also allows access to OpenVMS applications from SNA-based 3270 terminals and PCs.
- *MAILworks* - This product is Digital's product for providing a single, integrated, enterprise-wide electronic messaging environment. MAILworks acts as a software integrator which harnesses messaging products from multiple vendors into a single, "desktop-to-desktop" system. Products

MAILworks can integrate include; IBM SNADS, PROFS, Microsoft Mail and cc:Mail. The product supports CCITT X.400 messaging across TCP/IP and DECnet networks, in addition to X.435 EDI support and full X.500 directory support.

- *ACCESSWORKS* - This is Digital's software solution for users in multivendor environments who need access to data in multiple databases across multiple networks. ACCESSWORKS gives users transparent access from Windows, Macintosh, OS/2, HP-UX, AIX, SunOS, ULTRIX and OpenVMS client systems to numerous databases which support Enterprise Data Access/Structured Query Language standards. These include Digital's Rdb, Oracle, Sybase, Informix, dBASE, ADABAS, DB2, IMS, IDMS/R, VSAM and Allbase/SQL.
- *POLYCENTER* - Digital considers this a family of software tools or modules for multivendor network and systems management. Components include: POLYCENTER System Census; for system managers to automatically track PC hardware and software inventory and integrate this with inventories from other systems; and POLYCENTER Capacity Planner; a tool set for managers to use to predict the various impacts of changing hardware or application configurations in existing client/server systems.

In mid-1993, Digital and IBM struck an agreement for Digital to license and support its NetView 6000 network management product. Named POLYCENTER NetView, the jointly engineered and developed product supports DEC OSF/1 and Windows NT, as well as porting tools form DECmcc users on OpenVMS.

### *Operating Systems*

- *OpenVMS* - Digital has enhanced its own operating system and tailored it for its AXP platform line. Over 70 new, or enhanced, software products are available for OpenVMS including tools for software development, systems management, production systems, networking and clustering. OpenVMS's clustering capabilities, for example, now allow up to 50 Alpha AXP nodes to be configured into a cluster. Up to 96 nodes can be configured into a full cluster comprised of Alpha AXP and VAX systems. Digital has also expanded OpenVMS to support a wider variety of open standards, including: XPG3 BASE branding, POSIX, Motif, TCP/IP, SNA and FIPS 151-2.
- *DEC OSF/1* - As with OpenVMS, Digital has ported its UNIX operating system to the Alpha AXP platform group. A new component of OSF/1 is DEC FullSail, a component of the PATHWORKS group and a comprehensive systems management package which accommodates a larger number of systems and improves computer resource use by balancing loads for scalable numbers of multivendor,

UNIX-based systems. DEC OSF/1 enhancements include symmetric multiprocessing (SMP) support (available in early 1994), and support for fault tolerance on the Alpha AXP.

### *Hardware Platforms*

As part of its new product announcement in October 1993, Digital introduced its second generation of Alpha AXP workstations and servers. Overall, these systems are configured to server needs ranging from the desktop to the data center. Digital has positioned them to meet a lower price point and a higher performance standard than comparable platforms from such companies as Hewlett-Packard, IBM and Sun Microsystems. The platforms in the latest generation of Alpha AXP systems include:

- DEC 3000 Model 600 AXP, a desktop workstation designed for MCAD, ECAD, CASE and emerging technologies such as multimedia. It is priced from \$19,995.
- DEC 3000 Model 800 AXP, a tower-based workstation for such commercial and scientific applications as computational fluid dynamics, molecular modeling and systems simulation. The 800 is priced from \$36,000.
- DEC 2000 Model 300 AXP, Digital's low-cost server platform for desktop clients and application deployment. It is priced from \$9,695. Digital's least expensive server, the Alpha AXP PCLAN Server, is a variant of the Model 300 and is designed to manage LAN-based file and

print server applications using the PATHWORKS product family. The PCLAN Server is priced from \$6,995.

- DEC 3000 Model 600S AXP, a desktop server built for applications requiring high I/O bandwidth. The 600S will support more than 100 users and is priced from \$21,190.
- DEC 3000 Model 800S, designed for deskside deployment for 200 to 300 users. Like the 600S, it is designed for high I/O activity and is priced from \$34,130.
- DEC 4000 Model 700 AXP, Digital's department-level servers which can be configured with one or two CPUs for SMP functionality. The single CPU version, the Model 710, is priced from \$66,372.
- DEC 7000 AXP Systems, Digital's high-end, enterprise-level servers. These systems offer six-way SMP, support for up to 3.5GB memory and 10 terabytes storage. Designed for large-scale commercial computing, 7000 systems are priced from \$126,334.

Digital has also implemented the ADVANTAGE-UPGRADE Program, which combines the best features of its previous hardware upgrade programs. Under this program, Digital customers can upgrade their Digital VAX, AXP systems or MIPS systems through a single point-of-contact. Depending upon the size of existing systems and the extent of the desired upgrade, ADVANTAGE-UPGRADE services are priced from \$2,950 to \$345,000.

### *Services*

Digital Consulting (DC) is the company's worldwide consulting organization. DC works to develop client/server solutions for a customer's entire business process, which often includes the integration of legacy systems into new, distributed technological framework. Digital Consulting services include: business transformation/re-engineering, network integration, migration/downsizing, systems integration along with applications integration and development. Examples of specific services are described below:

- *Workgroup/User Services* - Through this service, Digital creates integrated work group systems based upon common office automation environments, in addition to its own LinkWorks product. Components available to the customer include familiarization, assessment, pilot and full-scale implementation and ongoing support for functions such as mail integration, personal productivity, groupware and work flow applications, desktop data access, PC LAN operations support and document and imaging applications.
- *Information Architecture Planning* - This is a component of systems integration consulting services where Digital helps customers use information technology to innovate business processes and increase competitive advantage. By helping establish a framework for standards, processes and technology, this service is



designed to make customers able to respond to future changes in business practices and technology.

- *Client/Server Distributed Application (CSDA) Planning* - As part of Digital's business transformation services, CSDA provides application redesign, application integration, legacy application protection and migration to client/server architectures and open client/server implementation with no vendor lock-in. CSDA can also create migration paths to object-oriented environments.
- *Rapid Application Prototyping* - The function of this applications integration service is to provide customers with informed examples of how client/server computing can eliminate the problem of data and applications spread across different computer environments. Using the custom parameters of a customer's computing environment, Digital creates a prototype client/server environment to illustrate the most effective means of implementing client/server methods.
- *System HealthCheck*, an assessment service for computing operations, system security and system performance to discover availability problems with critical applications before they can occur.
- *System Management Support*, which provides technical support to supplement a customer's internal resources for system management and performance.
- *Remote System Management*, a remotely delivered, customized solution for routine systems management to supplement existing customer resources.
- *Asset Management*, an in-depth service to aid customers manage multivendor information technology assets. This service provides support for planning, procuring, tracking, distributing, reporting and billing for managing asset costs.
- *Software Publishing*, a service where Digital assists customers replicate and distribute their software through Digital's software publishing operations.

The company's Multivendor Services (MCS) organization is specifically targeted at providing planning and design, implementation, management and systems integration services for Digital's client/server customer base. The company has developed the following key MCS service components:

## 5. Recent Client/Server Engagements/Contracts

The following three brief case studies illustrate Digital's recent client/server customer activity:

- *Bank of Montreal* - This bank's Corporate and Institutional Financial Services division utilizes LinkWorks to re-engineer its corporate banking business. The system is designed to greatly reduce the process of credit application preparation by allowing users to send and share application information in an integrated groupware environment that, the bank estimates, reduces preparation time by roughly 24 hours.

Digital helped the bank implement the system during a one month-long pilot project where the company acted as a software vendor and systems integrator.

- *SAS Institute* - This company itself is a client/server vendor, providing modular software packages for a multitude of applications including business planning, forecasting, decision support, operations research and project management. SAS' strategy is to make data an enterprise-wide resource available to any user or application, regardless of network, operating system or platform. Digital's ACCESSWORKS offered SAS another potential method for its customers to implement SAS products and access data. After testing and using ACCESSWORKS, SAS has successfully used the product and added its capabilities to its own client/server solutions.
- *Fox Chase Cancer Research Center* - On a regular basis, this genetic research facility runs extremely compute-intensive applications that

create high-resolution genetic linkage maps of the human body to aid the location of disease-causing genes. With Digital hardware and assistance, the center implemented a system which uses Alpha AXP workstation servers running DEC OSF/1. The servers are the system's backbone and give scientists access to a large, centralized repository they use for linkage mapping on AXP workstations.

Due to the speed with which the AXP platforms access and manipulate data, the center has substantially decreased the amount of time its complex mapping calculations require to complete.

### 6. Future Plans

The client/server product and direction announcement made in October 1993 is the biggest and, according to Digital sources, the most important one the company has ever made. What it represents is a fundamental change in the company's focus, which has become firmly directed toward client/server computing.

However, the company has stressed that the announcement does not put Digital into a holding pattern. Digital will continue to enhance existing products, including its most recent releases, and develop new products as customer and computing requirements change. For example, Digital has already announced plans to enhance the performance and integrateability of the OpenVMS AXP product group. Within 18 months,

OpenVMS AXP platforms will support 64 bit files and databases, provide 10 terabytes of on-line file space and 10GB per day of updateable file capacity. The company also continues to develop its AXP processors with plans to increase overall AXP performance over 50 times by 1996.

With UNIX, Digital is aiming for the number one or number two slot in the market by 1995, estimating it would need 15% of that operating system market share to do so. Currently, the company is conducting extensive sales force training so that every Digital salesperson worldwide will be UNIX-literate by early 1994. The company also estimates it is investing more for UNIX research, development and marketing than any other of its systems, although Digital could not provide specific numbers.

Therefore, like a shark, Digital will keep moving. With the trend toward client/server solutions firmly entrenched in the information technology infrastructure, Digital has committed itself to open systems and enterprise computing not only from a nuts-and-bolts perspective, but also from a managed business solutions perspective. The company believes the marriage of its technical products and experience with its consulting and professional services expertise, forms a good combination that will further the needs and goals of its client/server customers.

## ***7. Overall Assessment***

After revolutionizing computing in the 1960s and 1970s with the minicomputer, Digital spent much of the 1980s in a holding pattern which formed when the company downplayed the importance of the personal computer in favor of its core business, midrange systems. Although the last decade was a profitable one, Digital entered the 1990s in a shaky position where PCs and desktop systems were concerned. This has contributed in some measure to the company's declining profits in recent years.

However, this disappointing period in Digitals recent history may be coming to an end. It is to the company's credit that it has restructured and refocused itself both logically and quickly. With its business units barely one year old, the company believes it is already better able to serve its different customer groups and more effectively market and support its wide range of products and services. The more recent product release and client/server focus announcement are perhaps more important, for they will likely allow Digital to prove itself as a client/server solutions provider through its large existing customer base. As proprietary systems and single-vendor architectures continue to fade away, Digital will have ample inroads into the enterprise-wide client/server environment.

In addition to overall strategy, Digital has made bold moves with the development and introduction of the Alpha AXP chip and hardware and software systems which are based upon it. The company is betting its 64-bit superchip will become an industry standard for PC- and workstation-based client/server systems. With its commitment to both UNIX and Windows NT, Digital has positioned itself to offer the client/server market whatever operating system it makes, become the market leader.

The moves Digital has made define a company that has recognized the need for change, and acted. Although the company still has a huge installed customer base, these changes should pave the way for wider ranging opportunities in the future. In client/server, Digital has both the services and the product expertise necessary to continue as a major influence on, and vendor of, these trends and technologies.

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This profile is issued as part of INPUT's Client/Server Software Program.

If you have questions or comments on this profile, please call your local INPUT organization or Angela Hey at INPUT, 1881 Landings Drive, Mountain View, CA 94043-0848, (415) 961-3300.

# CLIENT / SERVER MARKETS & APPLICATIONS PROGRAM

INPUT

September  
1993

## COMPANY PROFILE: Gupta Corporation

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# GUPTA

The following profile outlines the products, services and support offered by Gupta Corporation to their clients for the implementation of downsizing, client/server and other distributed computing strategies.

### 1. Description of Principal Business

Gupta Corporation's (Gupta) principal business is based solely upon developing, marketing, and supporting an extensive line of integrated software products specifically targeted at the PC-based, client/server network market. Founded in 1984 by Umang Gupta and D. Bruce Scott, both former Oracle executives, the company has made a concerted effort to be the industry leader in this market. Its products include software systems for front-end software development tools, data base servers, and connectivity.

The company has positioned its products such that customers developing client/server systems with Gupta software benefit from lower hardware and software costs using less expensive PC-based

systems. This also preserves customer investments in existing mainframe or minicomputer legacy systems, which can be integrated with the networks. Gupta estimates that it has licensed over 133,000 copies of its software products in various customer segments worldwide. This includes 37,000 copies of the company's front-end tools, 65,000 copies of the data base server software, and 31,000 copies worth of connectivity products. Gupta has established a multitiered distribution system that provides its products in over 58 countries. Current customers include Bankers Trust, Citibank, Mitsubishi, Nabisco, Procter & Gamble, and Reader's Digest. The company's products and services are discussed in more detail in Section 4, *Client/Server Products and Services*.

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Exhibit 1

**Overall Financial Performance  
Gupta Corporation**

Revenues	1992 (\$ Thousands)	1991 (\$ Thousands)	1990 (\$ Thousands)
Product Revenue	29,961	19,574	10,002
Services Revenue	2,810	1,721	851
Costs and Expenses	30,332	21,402	16,109
Income (Loss) Before Taxes	2,143	187	(4,961)
Provision for (Benefit from) Taxes	381	128	(62)
Net Income (Loss)	1,762	59	(4,899)

Exhibit 1 provides an overview of Gupta's overall financial performance for the last several years. The company's fiscal year ends December 31.

## 2. Strategy for Supporting Client/Server Requirements

In 1988, Oracle and Sybase were porting their relational data base management products to a myriad of platforms, and Microsoft's Windows graphical interface for the PC was still a relatively new and unproven commodity. However, Gupta made the choice to strategically focus on the PC network market with its client/server software products. At the time, industry observers called this a risky strategy; however, it has for the most part been quite successful.

Gupta's ultimate goal as a company is to be the leading developer and supplier of client/server systems software for PC-based networks. In pursuit of this, Gupta has defined five key strategic elements:

- **Comprehensive product line:** The company has developed its front-end tools, data base server products, and connectivity software as an integrated suite of products that can also function as standalone items usable with products from other vendors. This enables Gupta to offer customers software solutions that are more complete and price-competitive with software from single-product vendors. The company believes that its focus on the PC network market gives it a competitive edge over vendors that have to rewrite their products for PCs that were originally developed for mainframes and minicomputers.
- **Price/performance:** Because Gupta's products are developed for and implemented on PC-based systems, the company has been able to offer customers pricing proportionate to the lower cost of PCs as compared to mainframes and minicomputers. The company believes this strategy has encouraged customers to develop applications and deploy them throughout their



organizations using Gupta software. In addition, by offering its software at PC platform-based costs, the company believes it can maximize its unit software sales.

- *Stratified distribution channels and strategic agreements:* Gupta has developed sales channels to meet the specific needs of a variety of client/server customers, which range from individual applications software developers to the information services departments of large corporations. These channels include: Gupta's corporate sales force that focuses on enterprisewide accounts; a worldwide network of value-added resellers (VARs) and distributors that focuses on departmental sales; and a telephone sales operation, called Gupta Direct, that handles small purchases by first-time buyers and additional purchases by existing customers. In addition, Gupta has developed the following two strategic alliance programs to market its products:
- *Independent Software Vendors (ISV) Program:* Through this program, Gupta has developed relationships with over 17 third-party software vendors that develop products compatible with the company's SQL System software group. The goal of this program, according to Jim Hermann, the company's Vice President of Marketing, is to expand the number of front-end software products customers can use with Gupta software. The company plans to have nearly 70 ISV partners signed up by the end of 1993. Current ISV vendors include Approach Software, Clarion Software, Computer Associates, JYACC, Mozart Systems, and Software Products International.
- *National Consulting Partner (NCP) Program:* Gupta established this program to develop alliances with professional services companies that provide consulting on client/server projects to Fortune 1000 firms. Through the NCP, Gupta identifies opportunities in the client/

server market to sell its software solutions in concert with NCP member consulting expertise. Current NCP companies include Grant Thornton, the IBM Consulting Group, Price Waterhouse, and Procom. According to Jim Hermann, Gupta's participation in this program will evolve to the point where the company will act purely as a product developer and technical support provider for NCP members' client/server consulting contracts.

- *Global market focus:* Approximately 52% of the company's fiscal 1992 net revenues came from sales in nearly 60 countries outside of North America. Gupta typically releases new software products on a worldwide basis and has established an international distribution network comprised of strategic partners, distributors, and foreign subsidiaries. In addition, the company has designed its software to support international data standards, and its front-end tools have been translated into French, German, and Japanese.
- *Tiered Support:* Gupta's support ranges from a pay-per-incident plan for smaller companies, or departmental customers, to its strategic technical account representation (STAR) service for large, enterprise-wide customers. The company also provides a license subscription service (LSS) to all customers for a fixed annual cost that provides up-to-the-minute availability of bug repairs and maintenance releases. Gupta also provides customer support through an electronic bulletin board, a fax-based technical documentation system called FAST FACTS, telephone hotline support, and video-based education and training.

According to Jim Hermann, the company believes that the market for client/server software aimed at PC-based systems will grow substantially, and Gupta will continue to pursue and develop the various components of its overall strategy.

### 3. Scope of Current Client/Server-Related Activities

In addition to its own ISV and NCP programs, Gupta is a member of the following vendor programs or alliances:

- The company is a member of IBM's Cooperative Software Program, a subgroup of the larger Business Partner Program. Through this membership, Gupta has developed AS/400 versions of its SQLWindows and SQLNetwork products, which IBM resells through its own sales and distribution channels.
- Gupta, Information Builders, Inc. (IBI), and Terrace Systems have formed a partnership to link Gupta's client/server tools to IBI's Enterprise Data Access/SQL connectivity software. The resulting system will allow PC-based users to access data residing on about 50 different third-party data bases and file structures on nearly 40 hardware platforms. The product will be called SQLRouter for EDA/SQL and will be available by the end of 1993.
- Dunn Systems has made its Novell network applications library available on Gupta's SQLWindows software products. Named SQLLib, Dunn's product is the first third-party library to be added on to Gupta's software. It provides built-in access to Novell NetWare services from Gupta's applications.
- In mid-1993, Gupta partnered with Segue Software to make Segue's QA Partner product available on Gupta's SQLWindows software. QA Partner is an applications-testing tool that allows customers using Gupta products for applications development to test their work in simulated situations before subjecting them to "real-world" conditions.
- Gupta has a partnership with Micro Decisionware, Inc. (MDI) to establish interop-

erability between Gupta front-end tools and MDI's Database Gateway. This will give Gupta users additional functionality for data distribution and warehousing. MDI is also an ISV member.

The company's alliances and partnerships have added to the variety and functionality of its products and opened strategic marketing channels. However, Gupta does have competition from the following vendor groups:

- Companies with sophisticated data base products originally designed for and sold to the mainframe and minicomputer markets include Gupta partner IBM, Informix Corporation, Ingres, Oracle Corporation, and Sybase, Inc.
- PC-based software product vendors, such as Microsoft and Borland International, offer data base server products and front-end tools for standalone PCs. Microsoft and Borland, in particular, are becoming quite active in client/server computing, and Gupta has announced that it is porting its products to Windows NT.
- Other vendors that develop and sell software targeted at the PC-based, client/server network market. These include Powersoft, Easel, and KnowledgeWare, all with respected front-end software products, as well as more financial, technical, and marketing resources.

Jim Hermann acknowledged that Powersoft has marketed its products more successfully than Gupta, which has concentrated more on product development. However, Hermann said Gupta is increasing its marketing staff so it can better sell Gupta products and still continue product development at current levels. Over the last several years, Gupta has allocated 20-25% of its budget to product research and development, and the company wants to continue R&D spending at this level.

#### 4. Client/Server Products and Services

Gupta's SQL System is comprised of software products for front-end applications development, data base servers, and connectivity. Individual products are described below in the appropriate functional category:

##### Front-end Tools

- **Gupta SQLWindows 4.0** - This software product is a graphical applications development tool for programmers designed for ease of use in PC-based, multiuser environment. With SQLWindows, developers can create department-level or enterprisewide applications, such as insurance claims processing, or on-line credit verification, with access to SQL data bases on networked PCs, workstations, mini-computers, and mainframes. Version 4.0 supports collaborative programming through its TeamWindows component, which allows teams of developers to jointly create client/server applications. TeamWindows features include code check-in, auditing, standards association, and screen templates. In addition, SQLWindows 4.0 incorporates object-oriented programming technology, including single and multiple inheritance, polymorphism, and user-defined window and function classes. SQLWindows also provides Multiple Document Interface, Object Linking and Embedding (OLE), and Cross Tab and Two-Pass Totaling for report writing.

SQLWindows 4.0 provides connectivity to the following data base systems: HP ALLBASE/SQL, IBM DB2, IBM OS/2 DBM, Novell NetWare SQL, Oracle Server 7.0, Microsoft and Sybase SQLServer, Incom SUPRA, HP TurboMAGE, Informix I\*Net, Ingres, and Gupta's own SQLBase Server for Windows.

- **Gupta Quest** - Quest is an end-user access query and reporting tool for use with SQL data bases. It has been designed to be easy to use

and allows even those who are inexperienced to query a department- or enterprise-level network and access data. Quest's report-writing feature enables users to create reports of varying complexity, or transfer data for report preparation to a PC application, such as Microsoft Word or Excel. The product also supports data management and querying, installation and deinstallation of individual Quest activities, query templates, OLE support for both client and server, cross tab and two-pass totaling. In addition, Quest incorporates Forms, a feature that allows users to perform data entry and querying with a forms-oriented interface, rather than a tabular interface. Quest can be used as a standalone product, but SQLWindows incorporates a version of it, called QuestWindows, that provides all of Quest's functionality to SQLWindows for report generation without programming or knowledge of SQL. Quest supports all of the SQL data bases noted above for SQLWindows.

##### Data Base Servers

- **Gupta SQLBase Server** - This product is a multiuser, scalable data base for the PC network environment, which will run under DOS, Windows, OS/2, UNIX, and Novell NetWare. Gupta is in the process of porting to Windows NT. SQLBase Server gives multiple users the ability to simultaneously do data entry, browse from client front-end applications to multiple sets of data records, and perform background reporting. It also supports the ANSI Level 2 standard for declarative referential integrity, data compression, precompiled SQL procedures, and scrollable cursors. Performance tests conducted by Gupta in early 1993 demonstrated that SQLBase Server is capable of performing over 100 on-line transactions per second.

- **Gupta SQLBase Engine** - The SQLBase Engine is a single-user data base engine for storing and retrieving data on a PC client platform instead of a network server. It allows a user to use front-end applications without having any network connection, enabling applications to run on portable computers and desktop PCs that only require occasional access to any central data base server. SQLBase Engine is sold separately and with SQLWindows for Gupta customers who want to develop applications or manage data on a single PC.

### Connectivity

- **Gupta SQLNetwork** - This consists of Gupta SQLRouters, Gupta SQLGateways, and SQLHosts that are designed to establish communication pathways between Gupta SQLWindows and Quest and different types of data base and platform servers. Gupta's connectivity product offerings allow customers to preserve investments in their mainframe or minicomputer technology while incorporating PC network computing. Also, these products enable Gupta to sell its application development tools to customers owning a data base from a different company.

SQLNetwork provides connectivity to the following data base systems: HP ALLBASE/SQL, IBM DB2, IBM OS/2 DBM, Novell NetWare SQL, Oracle Server 7.0, Microsoft and Sybase SQLServer, Cincom SUPRA, HP TurboIMAGE, Informix I\*Net, Ingres, and Gupta's own SQLBase Server for Windows. SQLNetwork also connects the IBM AS/400 platform to most major brands of PCs.

Gupta products are available individually, or bundled into one of the three following product offerings:

- **Gupta Project Starter Kit**, for small or department-level client/server projects

- **Gupta Partner Kit**, for the company's VAR allies
- **Gupta Enterprise Kit**, for large, enterprisewide projects

Each of these kits consist of Gupta products bundled in various configurations with support and training to match the level of complexity and size of a customer's client/server project requirements.

### 5. Recent Client/Server Engagements/Contracts

The following three brief case studies illustrate Gupta's recent client/server customer activity:

- **CB Commercial Real Estate** - With more than 4,000 employees, this company is one of the world's largest commercial real estate brokerages. In order to retain its competitiveness, the company developed a suite of real estate applications called PRESTO, for Professional Real Estate Tools. The system provides accounting and financial applications, and real estate applications that track property types, such as industrial or retail, property availability, and property vacancy.

CB has implemented PRESTO in over eight offices throughout the U.S. Component applications were developed using Gupta SQLWindows and Quest, both linked to the Gupta SQLBase Server. The system runs on Compaq SystemPro PCs connected on a Novell NetWare network.

- **Mobil Oil** - The toxicology department of this company needed a system to help it capture and track data gathered to perform hazard assessments for shipping hazardous chemicals. The department is required by the U.S. Department of Transportation to label all vehicles, such as trucks, with the proper signs indicating the type of chemical it is transporting and its potential hazards.

Using Gupta SQLWindows, Quest, and SQLBase Server, Mobil developers created MARBLES, a system allowing the company to maintain information of the products it manufactures and sells, as well as the hazardous chemicals it purchases from suppliers. It maintains information on over 10,000 chemicals and more than 200 attributes for each one. MARBLES has features that allow Mobil users to generate reports on dangerous chemicals in order to know how to ship them, how to identify them, and who supplies them.

- **State of California** - The Department of Housing and Community Development was required by legislation enacted in 1991 to inspect every mobile home in California for safety violations on a rotating, five-year time frame. Realizing the size of the job would require careful organization, record keeping, and hours of extreme labor, the department designed a custom Check List System to aid the task.

Using Gupta SQLBase Server with SQLWindows, the system maintains a complete list of all the mobile homes in roughly 6,000 parks within California. When the department's inspectors go to a park for inspections, they take with them forms and violation check lists produced by the Check List System. These application-generated forms are easy to track and organize and enable new data to be entered into the Gupta-based system more easily.

## 6. Future Plans

According to Jim Hermann, Gupta's goal is to solve the whole application development problem for the company's customers. This is the company's driving force and the focus of its ongoing product development efforts. Gupta will push forward with its policy to make its software easy to use, scalable, and open. Integration is

also a key focus, and Gupta's vision incorporates a growing list of Gupta-compatible data bases running on platforms that range from palm tops and PDAs to minicomputers.

The company believes it has products that are superior to those of its competitors but, as Hermann points out, "You can have a better product and still lose the war." Therefore, better marketing has become crucial to the company's strategic direction. Gupta is very aware that Powersoft, one of its primary competitors, has done a better job of promoting and selling software than Gupta has. To correct this, the company will maintain its product strategy of offering software in multiple client/server markets and continue to aggressively price its software to gain market share and name recognition.

The company will continue to pursue opportunities through its own partnership programs and alliances with other vendors. According to Hermann, the client/server marketplace suffers from a division of vendors who have either allied themselves with Novell or Microsoft. Gupta's allegiances place it closer to Novell's side, but the company believes that to commit completely to any large vendor would curtail its opportunities. At this point, Gupta intends to develop its software for the broadest possible range of existing and emerging technology.

## 7. Overall Assessment

For a company its size, Gupta has developed an ambitious and comprehensive market focus and product strategy. In the market to which it has devoted itself, the company has had measurable success selling its products and gaining acceptance and critical acclaim. However, competition in the client/server arena gains ferocity as time passes, and for Gupta to perform to the level of its ambitions the company must address some concerns:



- **Delivering on the vision:** Gupta is a still a young and moderate-sized company. It has competition from larger and more established companies in each of its software product markets. Gaining and maintaining definitive market leadership may be difficult for Gupta, considering the resources that will be required.
- **Service and support:** The company has been criticized in the past for not providing adequate service and support to its customers. While many of its competitors have packaged, comprehensive service and support products, Gupta is still primarily product-focused. In fiscal 1992, for example, software products generated 91% of the company's revenues and services accounted for roughly 9%. Services have become increasingly important to customers in

the client/server market, and Gupta could bolster its earnings if it improves this side of its business.

- **Products:** Gupta's products have been criticized for sacrificing some robustness and functionality in favor of ease of use. Also, the company has had some past delays shipping new products, releases, and upgrades.

Overall, Gupta is still a growing, evolving company with good, profitable products. In fact, the concerns discussed above may be nothing more than growing pains that have occurred because the company was underprepared for the success of its products. Regardless of the reasons, Gupta has positioned itself in what was originally a risky market and produced results. For this to continue, the company must continue growing.

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# CLIENT / SERVER MARKETS & APPLICATIONS PROGRAM

INPUT®

July 1993

## COMPANY PROFILE: INTERSOLV, Inc.

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The following profile outlines the products, services, and support offered by Intersolv, Inc. to their clients for the implementation of downsizing, client/server, and other distributed computing strategies.

### 1. Description of Principal Business

INTERSOLV, Inc. (INTERSOLV) is a software products company that provides applications development tools for desktop and local-area network (LAN) environments. INTERSOLV products are team-oriented, LAN-based, and target the development of production-grade applications. Their strategy is to provide products that allow organizations to build client/server, cooperative, or traditional applications and gain the benefits of single solution without being locked into a proprietary environment.

INTERSOLV products address four sectors of software development: analysis and design, code generation, software maintenance or redevelopment, and software configuration management. With these products, which are discussed below,

users can develop new systems or maintain and extend existing systems. Formed in 1991 through the merger of Index Technology and Sage Software, INTERSOLV currently has over 150,000 users of its products at roughly 10,000 sites worldwide. The company currently has 450 employees, 30% of which are dedicated to product development and support. Exhibit 1 provides an overview of INTERSOLV's financial performance over the last several years. The company's fiscal year ends May 30.

### 2. Strategy for Supporting Client/Server Requirements

INTERSOLV's fundamental product strategy emphasizes open systems architecture and the customer's ability to develop and implement

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applications in a wide variety of client/server methodologies and environments. The company has focused on providing solutions that allow its products to serve the specific needs of the customer, regardless of the mixture of PC, LAN, and mainframe technologies possessed by the customer.

This strategy forms the basis of INTERSOLV's mission to provide software developers with the tools necessary to cost-effectively integrate new development, legacy systems, and LAN-based computing to run production applications. Thus, the INTERSOLV approach allows customers to leverage existing mainframe and minicomputer systems into a client/server environment, avoid high hardware replacement costs, and increase the competitive advantage of quick applications development with optimal hardware utilization.

According to Mike Gilpin, INTERSOLV's Director of Product Management, customers using his company's products can "mix and match" client and server platforms and establish them on the same system. Gilpin also pointed out that INTERSOLV has designed its products in a modular way so that customers can use a single product, such as the Excelerator II analysis and design product (described in section 4), by itself, with the company's other products, or with products from other vendors. This "best-of-breed" approach is designed to protect customer investment in current hardware and software technologies, while allowing them to exploit new technologies as they become available.

INTERSOLV's product line addresses what the company defines as the three components of client/server design and implementation:

- The presentation component, which is the graphical user interface (GUI) that allows users to interact with an application;

Exhibit 1

### Overall Financial Performance INTERSOLV, Inc.

	1993 Revenues (\$Thousands)	1992 Revenues (\$Thousands)	1991 Revenues (\$Thousands)
Product Revenue	\$80,410	\$79,144	\$71,846
Investment and Other Revenue	52	302	1,413
Costs and Expenses*	75,912	70,231	77,521
Income Before Taxes	4,550	9,215	(4,262)
Provision for Taxes	1,365	2,764	(1,066)
Net Income	3,185	6,451	(3,196)

\* These amounts exclude one-time accounting charges related to acquisitions or restructuring expenses.

- The application function, which is the building and implementation of the actual application for the client/server system;
- The data management function, where users define concurrency requirements, data volume, security and integrity controls, network capacity, and server-to-server operations control.

Section 4 describes INTERSOLV's products.

### 3. Scope of Current Client/Server-Related Activities

With the growth and acceptance in the client/server market, INTERSOLV projects continued growth and its associated impact on their client/server products. All INTERSOLV products support client/server, cooperative, and traditional development. As this technology is incorporated into INTERSOLV's customer's applications development efforts, the company projects increased client/server revenues.

Of the company's 450 employees, 30% are dedicated to research and development. INTERSOLV currently deploys these employees in the company's three research and development

labs located in the northeastern U.S. The company sells its products through direct sales and telemarketing in the U.S. and Canada, and through subsidiary companies in the U.K., France, Germany, and Australia. In addition, INTERSOLV has distribution agreements with resellers in 40 other countries worldwide.

Approximately 61% of the company's fiscal 1993 revenue was generated in the U.S., with 39% coming from international operations.

#### 4. Client/Server Products and Services

INTERSOLV has positioned its client/server products to take optimum advantage of the desktop development environment and open architectures. The company has targeted the increasingly popular LAN-based application development environment, and its products support multiple development cycles, reusable rules, object-oriented technology, and shared LAN-based repositories. INTERSOLV's products focus on four software development areas: analysis and design; code generation; software maintenance or redevelopment; and software configuration management. Descriptions of the company's product solutions for these four areas follow:

##### Analysis and Design

- The Excelsator Solution for Requirements Analysis and System Design™—This is the company's toolset aimed at customers designing MIS applications on Microsoft Windows and IBM OS/2 in a LAN environment. Announced in March 1992, Excelsator II OS/2 (XL/II) incorporates Information Engineering Methodology, and other industry methods including Yourdon, DeMarco, Gane, Sarson and Chen. XL/II provides customizable multimethod support that encompasses planning and analysis of client/server application development for data processes, GUIs, and event modeling. XL/II also incorporates concurrent multiuser access to data resident on the INTERSOLV LAN-based repository (ILR).

Currently, XL/II supports IBM PS/2, IBM PCs and compatibles, IBM LAN Server, Microsoft LAN Manager and Windows, and Novell NetWare for OS/2 environments. In addition, INTERSOLV announced an upgrade to its LAN Repository (ILR) for XL/II in March 1993. ILR now supports the UNIX platform running the Sybase SQL Server.

##### Code Generation

- The APS Solution for Prototyping and Application Generation™—INTERSOLV has positioned APS as an "industrial strength" applications generator for developers building on MVS and DOS/VSE hosts, AS/400s, and on DOS, Windows and OS/2 workstations. In addition, APS supports Oracle and Sybase data base repositories, and IBM CICS IMSDC, IMSDB, DB2, VSAM and APPC.

Released in September 1992, APS Version 2.2 allows developers to generate application code using a GUI front-end, without requiring them to learn multiple platform configurations or distributed application communications protocols. Furthermore, APS 2.2 allows for applications building without a data base server architecture which forces all functions onto the client or is tied to proprietary Standard Query Language (SQL) technology. INTERSOLV announced its APS Windows Generator in March 1993. Windows Generator has added further refinements to APS' ability to support cross-platform applications building from and for both Windows and OS/2.

##### Software Maintenance/Redevelopment

- Design Recovery—Used in conjunction with XL/II, this product enables developers in DOS, Windows, and OS/2 to migrate applications on legacy systems to a client/server environment. Design Recovery analyzes and automatically captures the appropriate process logic, data definitions, and user interfaces from the legacy application for use in the client/server application. This allows existing software to be modi-

fied to support new user requirements, technology changes, and business goals.

### Configuration Management

- **The PVCS Solution for Software Configuration Management™**—The PVCS product series provides configuration management for client/server applications developed for PC-based LANs running on DOS, OS/2, Windows and UNIX. The latest version, PVCS 5.1, was announced in February 1993.

PVCS Configuration Builder automates the process of reconstructing software systems that are being reconfigured away from mainframe- or mini-based environments to client/server systems. Using modular, object-oriented methods, Configuration Builder automatically assists with documenting changes to system components while invoking the compilers, linkers, and other tools needed to rebuild the new client/server system.

PVCS Version Manager works with Configuration Builder and allows developers to revise application codes while PVCS maintains the integrity of previous code versions. With Version Manager, users can recall changes to the application code and track why and when the code was altered.

During 1993, versions of PVCS have been announced supporting the HP-UX and Softbench environments, as well as interfaces to Powersoft's PowerBuilder, Digital Team V, and Symantec IDE. PVCS already supports Windows, MS DOS, OS/2, SunSoft, AIX, SunOS, Solaris, SCO UNIX and System V/386. For client/server implementations where a mainframe exists, INTERSOLV provides the Production Gateway, which offers LAN-based software configuration integration with most host-based library systems.

Although INTERSOLV is first and foremost a software vendor, the company does provide implementation training and education services to its customers. The company is committed to

guaranteeing the successful installation and operation of it. In addition, the company offers maintenance services to customers, who can obtain product enhancements and upgrades, and telephone hotline support.

### 5. Recent Client/Server Engagements/Contracts

The following two brief case studies illustrate INTERSOLV's recent client/server customer activity.

- **Blue Cross/Blue Shield of South Carolina (BCBS)**—As South Carolina's largest health insurer, BCBS has been attempting to improve the cost-effectiveness of its data center and applications development efforts. Managers at BCBS have determined over the last several years that their company must more efficiently utilize hardware and applications software in order to provide competitive and innovative products to its customer base.

Rather than completely discard its legacy systems, BCBS has used INTERSOLV's APS series to develop client/server applications that will utilize existing mainframes, minis, and new PCs. Using APS, BCBS was able to convert two systems, the Sales Information Management System and the Reimbursement Management System, from two IBM CICS mainframe applications to CICS/OS/2 client/server applications. Subsequent development and conversion yielded two systems which run on a mainframe-to-PC client/server system using DB/2 and OS/2 Database Manager. The two applications were converted into single-source code and can reside on the mainframe or a PC LAN, as BCBS further changes its platform environments.

- **Tipton Cole & Co.**—This company develops specialized software applications for the U.S. oil and petroleum industry. Frequently, products it sells to a single client will have to be modified depending upon where the client

wants to install the application. This frequently occurs in multiple sites. Tipton Cole also provides updates and revisions to customers in an ongoing basis. As a result, the software developer needed a version control system to help it manage its software development and revision process.

By utilizing INTERSOLV's PVCS products, Tipton Cole was able to develop its own version management system, whereby Cole developers, on a multiple 386 PC Novell NetWare LAN, were able to develop and update the company's software products in a more cooperative and efficient environment. By standardizing and monitoring the development process with PVCS, INTERSOLV estimates that Tipton Cole reduced administrative and clerical work related to software development by nearly 85%.

## 6. Future Plans

INTERSOLV is gearing up to further incorporate object-oriented technology in its products. By the fourth quarter of 1993, the company plans another release of Excelerator II that will make fuller use of object-oriented design for applications development. Through an alliance announced in June 1993 with Digitalk, Inc., INTERSOLV plans to jointly develop and market object-oriented features for PVCS and integrate it with Digitalk's Team/V (TM) object-oriented collaborative programming product. In April 1993, INTERSOLV announced a similar alliance with Powersoft Corporation, whereby the two companies will also develop and market object-oriented tools for PVCS. Powersoft will integrate PVCS Version Manager into its PowerBuilder 3.0 object-oriented client/server development product.

The company is also targeting Windows NT as a strategic opportunity. INTERSOLV was a beta test site for Microsoft's fledgling operating system, and the company may support NT by the first quarter of 1994. According to Mike Gilpin,

the company is currently planning NT versions of Excelerator II and APS, but these are contingent upon when Microsoft releases the working NT code, as INTERSOLV products did not run well on every beta version of NT.

INTERSOLV will also continue to develop UNIX applications for its products, most notably Excelerator II and APS. According to Gilpin, UNIX is a viable operating environment which has HP, Sun, Novell and others behind it.

## 7. Overall Assessment

INTERSOLV stresses that it is not a CASE tools vendor but a provider of desktop applications development tools and methodologies. In the client/server market, where the players are numerous, distinctions are important. The company has not made the mistake others have made by trying to provide all-encompassing solutions. Company strategy dictates that by concentrating on the products and making them modular and more accessible to multiple environments, INTERSOLV will be able to produce better products more quickly in the changing client/server market.

This may be one underlying reason for INTERSOLV's decision to drop from IBM's AD/Cycle Program in August 1992. Although the two companies still respect each other, INTERSOLV has found it better to rely on its own direction and sense of strategic purpose. It has also reduced its reliance on Big Blue, although the company's products still conform to AD/Cycle guidelines. By allying itself instead with companies like Powersoft, INTERSOLV seems to be gaining and giving strength through alliances, which may help it further prosper in the client/server market.



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# CLIENT / SERVER MARKETS & APPLICATIONS PROGRAM

INPUT®

August 1993

## COMPANY PROFILE: Powersoft Corporation

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The following profile outlines the products, services and support offered by Powersoft Corporation to their clients for the implementation of downsizing, client/server and other distributed computing strategies.

### 1. Description of Principal Business

Powersoft Corporation (Powersoft) has experienced two incarnations since it was initially incorporated in 1974. As Computer Solutions, Inc. the company specialized in the development of manufacturing management software, which culminated in the introduction of GrowthPower, a commercial MRP software package, in 1982. In 1988, Powersoft began developing what would become PowerBuilder, which was originally intended as a applications software development tool to help the company further develop GrowthPower. Gradually, the company concentrated more effort on PowerBuilder and its potential in the emerging client/server market.

Computer Solutions renamed itself Powersoft in 1990 and commercially released PowerBuilder in

June of the following year. With the growing success of this product, the company sold virtually all its interest in GrowthPower during the first half of 1992 in order to concentrate on further developing PowerBuilder.

Since renaming itself, Powersoft has completely dedicated itself to providing applications development tools and solutions to the client/server market. As of February 1993, the company had licensed more than 8,000 copies of PowerBuilder to over 2,000 customers worldwide, including American Airlines, Dell Computer Corporation, Electronic Data Systems, and Microsoft Corporation. Exhibit 1 provides an overview of Powersoft's overall financial performance for the last several years.

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Exhibit 1

**Overall Financial Performance  
Powersoft Corporation**

Revenues	1992 (\$ Thousands)	1991 (\$ Thousands)	1990 (\$ Thousands)
License Revenue	17,560	\$4,088	-
Services Revenue	3,633	626	55
Costs and Expenses	17,985	7,851	1,725
Income Before Taxes	3,227	(3,077)	(1,663)
Provision for Taxes	227	5	1
Net Income	3,540	(2,741)	(640)

**2. Strategy for Supporting Client/Server Requirements**

According to Doug Miller, Powersoft's Director of Strategic Marketing, the company's mission is to become the leading supplier of client/server application development tools, thus allowing more and more of its client base to build their own applications. The company has aimed its PowerBuilder application developer toward the middle of the client/server spectrum, having determined that the customer's greatest strategic advantage is gained when both client and server are used to optimize local-area network (LAN) access to the development process. Pragmatically, Powersoft's goal is to make applications developers more than the programmers they have traditionally been and to open up applications development to a wider circle of IS professionals.

The company has developed PowerBuilder by incorporating certain concepts that Powersoft has determined crucial to providing strategic benefits to its customers. In brief, PowerBuilder is designed to be:

- **Object Easy** - PowerBuilder incorporates a level of object orientation that does not require developers to be masters of the underlying languages incorporated into the applications they are building. PowerBuilder incorporates reusable objects stored on a repository to increase the speed and productivity with which client/server applications are built.
- **SQL Smart** - Although PowerBuilder is not tied to SQL-based relational data bases, the product does incorporate the ability to develop applications in this environment. By having this flexibility, PowerBuilder can be effectively utilized by customers who use SQL-based systems and those who do not.
- **Windows Rich** - Powersoft recognized early on both the popularity and importance of the Microsoft Windows environment. PowerBuilder extensively supports applications development in this environment, including features such as Dynamic Data Exchange, Dynamic Link Library, Object Linking and Embedding, Multiple Document Interface, drag-and-drop objects, and TrueType fonts.

- **MIS Friendly** - PowerBuilder has been designed to support and manage large applications development projects. The product allows project managers to efficiently track development through specific reports and an object library that tracks the location and status of application object modules.

Powersoft's corporate philosophy dictates that the modern user has to have options and does not want to be a slave to any one client/server solutions vendor. The accessibility of open systems to a broad range of components is the company's fundamental belief. Not only has PowerBuilder been engineered to embody this, but Powersoft has also established its Client/Server Open Development Environment (CODE).

CODE is Powersoft's blueprint for the future development of PowerBuilder and a strategic means of increasing the products capabilities and market acceptance. Through CODE, Powersoft has developed partnerships with numerous other vendors whose client/server component products are complementary to PowerBuilder and vice-versa. CODE Partners include companies in the following areas:

- CASE, including Bachman Information Systems, INTERSOLV, Inc., and LBMS, Inc.
- Connectivity, including Attachmate Corporation, and Wall Data, Inc.
- Data bases, including Hewlett-Packard, Informix Software, Inc., Oracle Corporation, and Sybase Corporation
- Gateways, including Information Builders, Inc., and Micro Decisionware, Inc.
- Source management, including Legent Corporation
- Strategic operating platforms, including Apple, Microsoft, IBM, and Novell

Through CODE, Powersoft seeks market leadership by leading the movement toward interoperability of the multiple technologies and products that already proliferate, to the mutual benefit of users, with heterogeneous needs and environments and vendors who seek to provide solutions. Powersoft refers to this as "creating a community of good client/server citizens."

Section 4 describes PowerBuilder and Powersoft's support services.

### **3. Scope of Current Client/Server-Related Activities**

As PowerBuilder is focused exclusively on client/server applications development, all of the company's business is generated in this market. In the first quarter of 1993, PowerBuilder generated \$8.6 million in revenues, and the company projects revenues of \$41 million for 1993. This is nearly double the \$21.2 million reported for 1992. Research and development claimed 15% of the companies costs and expenses for 1992, for which the company has dedicated nearly 30 employees.

Although 88% of PowerBuilder revenues for 1992 were generated in North America, the company does have international value-added resellers (VARs) and distributors which provide 100% of the PowerBuilder licenses sold worldwide. The company projects that international sales will also account for 12% of its 1993 revenues. VARs account for 50% of PowerBuilder sales in the U.S. For the remaining percentage, Powersoft has established 10 offices nationwide that make PowerBuilder sales directly. The company also does telephone sales from corporate headquarters.

With roughly 8,500 copies currently licensed, PowerBuilder is used by companies in the following industry sectors: energy and transportation;

manufacturing; consumer products; pharmaceutical; financial services; broadcasting and entertainment; and computer hardware and software. Typically, Powersoft provides its product for the applications development segment of a larger contract supervised by one of the company's CODE partners, or VARs, which usually are systems integrators. Powersoft provides behind-the-scenes, subcontractor support in these relationships.

#### 4. Client/Server Products and Services

Powersoft is a single-product company, and PowerBuilder has been positioned as a full object-oriented, Windows-based client/server development tool. It allows teams of developers to build graphical applications with access to RDBMS objects stored locally or on local-area network (LAN) servers.

PowerBuilder's features incorporate the four criteria summarized in Section 2. It supports SQL-based data bases from Microsoft, Sybase, Gupta Corporation, and Oracle. In addition, it supports non-SQL products from XDB, IBM, and Informix. PowerBuilder gives users the ability to access information from a mixture of these data bases and display it concurrently in a single window. In addition, the DataWindow feature provides an interface with SQL data bases without requiring developers to know an SQL.

The product also has object-oriented functionality that gives users the ability to create custom objects, such as user-defined events, and define them as functions for reuse in developing multiple applications. In order to control object-oriented development, PowerBuilder supports a centralized application repository that stores objects and controls developer access to ensure

version integrity. It also supports the Microsoft Windows controls, events, and functions discussed in Section 2.

Powersoft is currently beta testing version 3.0 of its product, and expects to ship it by August 1993. The new version will expand on the functionality of the current 2.0 version by adding data base support, object-oriented, management reporting, and Windows NT support features. By the fourth quarter of 1993, Powersoft plans to produce a 3.1 version that will support Windows' Object Linking and Embedding 2 feature. PowerBuilder 3.0 will also introduce two new related products called PowerMaker and Power Viewer. These products, targeted for developers and end-users respectively, are data base query and reporting tools. The company also plans to produce a scaled-down version of PowerBuilder in late 1993 aimed specifically at the end-user.

Powersoft's support services are provided to ensure the customer's success in implementing and using PowerBuilder. PowerStart is the company's implementation support group which provides initial implementation and consulting services. Customers are entitled to free support for the first 30 days of implementation. PowerStart then performs an audit six months subsequent to implementation to guarantee customer satisfaction. In addition, 80% of licensed Powersoft users subscribe to the company's telephone support, which includes a "fax back" feature that allows callers to obtain fax information from a telephone keypad menu.

The company's Education Program offers PowerBuilder training from Powersoft personnel and nearly 80 certified training partner companies and consultants who use Powersoft-issued materials to train users on-site.

## 5. Recent Client/Server Engagements/Contracts

The following four brief case studies illustrate Powersoft's recent client/server customer activity.

- **American Airlines** - The American Airlines Flight Academy required an application to schedule and coordinate pilot training activities for more than 11,000 pilots and instructors in its 350 classrooms, flight simulators and auxiliary facilities worldwide. The system had to be responsive, easy-to-use and provide heavy on-line transaction processing capabilities to keep scheduling operations running smoothly. It would also need to ensure the data integrity required by the Federal Aviation Administration.

American selected PowerBuilder to build its Flight Academy Accounting, Scheduling and Tracking System, which is a client/server based system that provides information through 300 different window functions. It operates 18 hours-per-day and supports concurrent use by nearly 50 planning and scheduling personnel, and the 11,000 pilots and instructors worldwide.

- **Fidelity Investments, Inc.** - This company used PowerBuilder to create a Financial and Management Information System (FAMIS) that enables users to gather and analyze data from multiple data bases running on mainframes and PCs throughout the company's numerous business units. This provided an enterprisewide client/server solution to gathering the data manually from many sources over a longer period of time.

FAMIS was initially distributed to 100 analysts and managers, but Fidelity is currently deploying it to 350 senior financial executives companywide.

- **Cigna Corporation** - This company used PowerBuilder to construct an insurance registration and processing system that handles sales transactions and generates customized insurance policies and customer ratings. It effectively communicates with the home-office information system for billing and accounting activities and provides high-volume on-line transaction processing for 300 end-users performing 1,000 transactions daily.
- **Dun & Bradstreet Software** - D&B found it necessary to provide its mainframe-based software customers with a way to migrate D&B applications to a client/server environment. The company utilized PowerBuilder to develop client-based applications that offered D&B customers a way to use their mainframes in a client/server environment, thus extending their usefulness. To date, D&B has licensed more than 250 copies of PowerBuilder.

## 6. Future Plans

According to Doug Miller, client/server applications development and the telephone have a lot in common. Miller has explained that in Powersoft's vision of the future, applications development will be so universal and sophisticated that end-users will be able to build their own applications as easily as dialing home. In the company's view, the MIS role will be to build the networks and hardware systems, such as the phone company, while end-users will perform the object exchange and applications development on these systems, like talking on the phone. The technology will be transparent.

However, Miller admits that taking users from A to Z is usually damaging and almost never works. With the impending release of PowerBuilder 3.0, Powersoft will take another step toward creating



the "object-enabled enterprise" that can create its own applications.

The company's CODE program is a crucial part of the PowerBuilder evolution. Powersoft will continue to emphasize open systems and interoperability through alliances with component vendors that will enrich PowerBuilder's features and market acceptance.

## 7. Overall Assessment

There is always an inherent risk in being a one-product company. Through its CODE program Powersoft has devised a wise strategy for enriching and promoting PowerBuilder. If CODE yields the results Powersoft hopes for, PowerBuilder could evolve beyond a single entity into a suite of products with wide acceptance as client/server solutions.

However, the competitive environment in this area is becoming more heated. Powersoft already

competes directly with Gupta Corporation and KnowledgeWare, two companies with longer track records and longer-standing alliances. In addition, Microsoft Corporation has recently targeted client/server applications development as a strategic market segment. Doug Miller admits his company is already in a state of "cooperative competition" with the software giant. Gupta, KnowledgeWare and Powersoft are all developing Windows NT support. The players do not even know who will win.

PowerBuilder has been criticized, particularly early in its release cycle, for not having as high a level of functionality as competitors' products. Powersoft freely admits that its strategy has been to make PowerBuilder easier to use than other products and to add to its functionality as user needs dictate. Perhaps this strategy has given PowerBuilder the appeal that has made it so successful since its introduction and will carry its evolution forward.

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# CLIENT / SERVER MARKETS & APPLICATIONS PROGRAM

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September 1993

## COMPANY PROFILE: Tandem Computers Incorporated

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The following profile outlines the products, services and support offered by Tandem Computers Incorporated to their clients for the implementation of downsizing, client/server, and other distributed computing strategies.

### 1. Description of Principal Business

For nearly 20 years, Tandem Computers Incorporated (Tandem) has been a leading manufacturer and provider of massively parallel, fault-tolerant computer platforms and network systems for continuous on-line transaction processing (OLTP) applications. Since it shipped its first NonStop computer system in 1976, the company has continued to develop and position its systems to meet the increasing demand for continuously available and highly reliable access to uncorrupted, up-to-the-minute data. Tandem systems are used not only for business-critical, in-house processing applications, but also support automatic teller machine (ATM) and point-of-sale (POS) networks, stock exchanges, directory

assistance and 911 telephone services, just-in-time (JIT) manufacturing systems, and health claims processing services.

Tandem's client/server business is conducted by its Client/Server Initiative, a cross-functional business group that supplies customers with Tandem hardware and software products, systems, and services tailored to meet the customer's needs. Through the Client/Server Initiative group, Tandem provides server hardware platforms that scale from entry level, for desktop applications, to massively parallel, supporting large-scale transaction processing applications. The company's Transaction Services architecture supports multiple forms of transaction processing, including UNIX System Laboratories' (USL)

Exhibit 1

**Overall Financial Performance  
Tandem Computers Incorporated**

Revenues	1992 (\$ Millions)	1991 (\$ Millions)	1990 (\$ Millions)
Product Revenue	1,665	1,551	1,539
Services Revenue	371	371	326
Costs and Expenses*	2,072	1,863	1,677
Income Before Taxes	(31)	57	187
Provision for Taxes	10	22	65
Net Income (Loss)	(41)	35	122

\*In fiscal 1992, Tandem took \$106 million in pre-tax restructuring charges.

Tuxedo, DCE PRE, and IBM's SPICY. Tandem's Remote Server Call, a client/server transaction integrity product, and NonStop SQL, a scalable data base for large client/server decision support systems, are two major software components of the company's Client/Server Initiative offerings. The Client/Server Initiative is committed to providing open interfaces for client/server computing and supports multiple standards for data access, transaction processing, local-area network (LAN) connectivity, and message-enabled applications. Products and services are further discussed below in Section 4, *Client/Server Products and Services*.

Exhibit 1 provides an overview of Tandem's overall financial performance for the last several years.

## **2. Strategy for Supporting Client/Server Requirements**

Tandem believes there are two parallel trends in the computer industry—downsizing and rightsizing—that have synthesized into the move-

ment toward client/server. Tandem takes a comprehensive view, whereby customer-server technology is "upsizing" the corporate computing environment into more broadly based enterprisewide solutions. In the company's view, capturing, moving, storing and accessing data is truly enterprisewide, as it may encompass not only a single company, but also that company's suppliers, distributors, and customers. Furthermore, Tandem views client/server technology as more than a desktop activity; it is a customer services and customer delivery tool that a company uses to implement customer-oriented client/server information appliances and services.

To serve this end, Tandem's stated mission is to supply reliable, open, and cost-effective servers, solutions, and services to meet the needs of customers requiring enterprisewide client/server technology. Tandem has applied its fault-tolerant, highly available mainframe architecture to the client/server model and believes that these features are crucial to migrating business-critical applications to a distributed system.

The company's new NonStop Himalaya Range (described in Section 4, *Client/Server Products and Services*) is the embodiment of Tandem's client/server product strategy. When Tandem President and CEO Jim Treybig formally introduced the Himalaya Range in July 1993, he said that his company has remolded its research and development direction to base it more on RISC-based architecture and the UNIX operating system. The new systems are designed to provide fault tolerance, high reliability, parallelism, and scalability across client/server networks. In addition, Tandem's new servers offer:

- *Lower costs than the company's previous hardware products:* For example, the largest of the new servers, the K10000, is \$800,000 less expensive than the \$1.2 million price of Tandem's Cyclone series. This is intended to eliminate traditionally high cost associated with fault-tolerant systems.
- *Reduced customer software costs:* The company's new NonStop Kernel operating system for the Himalaya Range accommodates the company's existing proprietary Guardian operating software and a UNIX personality based on POSIX. This has been established to satisfy the company's existing proprietary customers and new customers who desire UNIX-based open systems.

Tandem's ultimate vision is for the NonStop Himalaya Range to become the basis for a wide-ranging electronic information infrastructure. The company terms this vision "Instant Information Everywhere," a phrase that describes a client/server network environment incorporating, for example, Apple Computer, Inc.'s Newton devices accessing Tandem server-based business applications through Motorola cellular systems. Both

Apple and Motorola have announced their support for this vision, although specific details for the implementation of this plan have not been released.

### **3. Scope of Current Client/Server-Related Activities**

Tandem sells and supports its client/server products primarily through an end-user sales force spread throughout 140 cities in 35 countries worldwide, although sales and support is done by exclusive distributorships in some Asian and Latin American countries. In specific industry markets, such as cable television and newspapers, Tandem uses other equipment manufacturers as a sales and support channel.

In geographical terms, 49% of Tandem's fiscal 1992 revenues was derived from operations in the U.S., an increase of 2% over 1991. Revenues from European operations generated 31% of fiscal 1992 revenues, a drop of 1%. Intercontinental operations, which includes all worldwide regions except the U.S. and Europe, accounted for 20% of the company's total revenues, a decrease of 2% from 1991.

Tandem markets its client/server products and services by focusing on industries experiencing leading-edge growth in the utilization of new technologies to meet business-critical needs. This includes telecommunications, banking and financial services, retail distribution, health care, and manufacturing. The company's Tandem Telecom division, for example, supplies continuously available computer systems for the telecommunications industry. Applied Communications, Inc., a subsidiary, develops software systems for the financial services industry. In addition, Tandem has these additional divisions or subsidiaries:

- The Integrity Systems Division designs and sells fault-tolerant, UNIX-based systems.
- Array Technology Corporation, a subsidiary, makes storage subsystems based on a technology incorporating redundant arrays of independent disks.
- Ungermann-Bass, Inc. provides enterprise networking systems and global network integration.

Tandem currently employs about 10,500 people, but intends to lay off 15% of them, roughly 1,700, by the end of calendar year 1993. This round of layoffs follows a decrease in 1992 of nearly 700 Tandem workers. The company is scaling down its workforce in ongoing attempts to reduce corporate costs and revitalize the company's shaky financial performance during the last several fiscal quarters.

#### 4. Client/Server Products and Services

As mentioned above, Tandem has traditionally supplied mainframe-based computing solutions to customers requiring the company's fault-tolerant, high-availability technology. With the introduction of the NonStop Himalaya Range in July 1993, Tandem has officially applied its traditional technological focus to client/server platforms. The Himalaya Range includes:

- NonStop Himalaya K100, Tandem's entry-level server platform, is designed for local-area network (LAN), office and deskside environments. It is based upon the company's previous generation of parallel CLX/R systems.
- NonStop Himalaya K1000, the scalable, midrange server, is designed for wide-area and distributed processing applications and environments. This server is based on Tandem's Cyclone/R systems.

- NonStop Himalaya K10000 is a massively parallel server for commercial processing environments. It is capable of operating with over 4,000 parallel processors and is based on MIPS 4400 RISC processor technology.
- NonStop Kernel, developed specifically for the Himalaya Range, is Tandem's first open systems software offering. It supports both Tandem's proprietary Guardian operating system and the UNIX personality, SQL, and C, on which the TUXEDO system is based.

In addition, Tandem offers the following product groups to address specific needs in the client/server market:

- *LAN products on the server:* Includes transport and network application services for TCP/IP and OSI; NETBIOS APIs and DOS files services; Ethernet connectivity; and Named Pipes interface to the SQL gateway. The company also will introduce the following products in the next 12 months: SPX/IPX transport and API access to the Novell Directory, Security, and Printer services; SNA 2.1 over Token Ring; LAN-attached printer support; and OSI application services over TCP/IP.
- *Data base access for decision support:* NonStop SQL, Tandem's relational data base, is designed for high-volume transaction processing. This product automatically divides a single data base request into segments and allocates these segments across processors in the server, allowing them to be processed in parallel. Currently, the company offers the SQL Sybase Gateway, the Oracle Gateway, ODBC access, and the DAL Gateway to NonStop SQL.

- *Data base access for transaction services:* Pathway Open Environment Toolkit (POET): Is Tandem's software product for developing business-critical OLTP applications in the Microsoft Windows environment on PCs and workstations. POET supports Dynamic-Link Libraries tools, Caseworks' CASE:W VIP, Microsoft's Visual Basic, and centralized name services.
- *Remote Server Call (RSC):* RSC is the company's software product that applies the client/server processing model to POET-developed applications. It is designed to perform OLTP processing by allowing client portions of a given application to be moved to a PC or workstation, where RSC manages transaction requests with the server. RSC features transaction processing through Tandem's Transaction Monitoring Facility, cooperative processing, and support for workstation development tools.
- *NonStop TUXEDO:* Developed through an alliance with Novell's UNIX System Laboratories (USL) subsidiary, NonStop TUXEDO is Tandem's newest OLTP transaction-monitoring software product. It combines and integrates USL's UNIX-based TUXEDO product with transactions services features from Tandem's NonStop Kernel operating system for the Himalaya Range.

Tandem also provides numerous services directly targeted at assisting customers implement client/server systems. The company's professional services group addresses planning, design, development, implementation, and operations management of applications needs by analyzing a customer's specific situation. Tandem's professional service offerings to client/server customers include:

- *Client/Server Needs Assessment Service:* This service helps the customer assess the applicability of client/server for a planned business application and analyzes the proposed application's feasibility, risks, benefits, and planning.
- *Client/Server Quickstart Workshop Service:* Is an educational service designed to help customers understand the technologies, tools, products, and issues involved in a Tandem client/server computing environment.
- *Client/Server Application Architecture Service:* This allows customers to establish a technical architecture for a client/server application. A related service, Client/Server Application Construction, familiarizes the customer with object-oriented application construction techniques. In addition, the Client/Server Application Design Service assists customers when designing an OLTP application that uses Tandem's RSC and Pathway products.
- *Human Interface Service:* Helps customers with designing, reviewing, and using client/server applications.
- *Client/Server Project Planning Service:* This is an aid to customers in planning their client/server hardware and software environment and application implementation. This includes LAN and PC selection and sizing, PC development and production software selection, and the development of a project plan for implementing a client/server application.
- *Client/Server Environment Installation Service:* Tandem provides the customer with the installation and setup of the LAN and PC environment, as well as the installation and configuration of the operating system, development, and production software groups.



- **Client/Server Operations Planning Service:** This aids customers with the planning of their client/server operations environment and application implementation, including procedures for daily operations, startup, backup/recovery, and troubleshooting.

Some of these services, such as the Quickstart Workshop, are packaged offerings. However, most are delivered at the level appropriate to a customer's client/server needs to incorporate Tandem's methodologies and practices into a specific solution. The goal of Tandem's professional service offerings is to give customers the same levels of high availability in the client/server environment that they had in mainframe environments. The company is also currently developing services to help customers integrate existing legacy systems into client/server computing scenarios.

### 5. Recent Client/Server Engagements/Contracts

The following three brief case studies illustrate Tandem's recent client/server customer activity.

- **Viking Freight:** Tandem helped this company develop two custom client/server applications. The first is an imaging system the company uses for retrieving documents such as bills of lading. The other application is a dispatch management system for applications that track the location and disposition of freight. Viking chose Tandem because the company was able to deliver high performance at a low cost of development and ownership.
- **Western Union:** This company used Tandem to develop a client/server-based telephone call receiving and routing center for funds distribution. The center integrates Tandem NonStop

servers, automatic call distributors, and Tandem workstations. The center has increased both operator response times and productivity.

- **Broken Hill Properties:** This steel manufacturing company runs all of its administrative, business, and manufacturing applications on a client/server system using cooperative processing techniques and Tandem NonStop servers.

### 6. Future Plans

Tandem became an industry leader by building and selling fault-tolerant parallel processing mainframes. By applying these concepts to client/server technology, Tandem is aiming for a unique market position that will make its NonStop Himalaya Range the basis for the continuously available client/server network services, which the company believes will develop as client/server computing becomes more pervasive and popular.

The company is firmly committed to the "Instant Information Everywhere" vision described by Jim Treybig at the introduction of the Himalaya Range. Tandem's goal is to support this broad-based architecture and provide it with services for OLTP, decision support, information access, electronic messaging and network applications. This is the fundamental focus of the company's Client/Server Initiative, which is further committed to developing the products and the services enabling the company to achieve this goal, while gaining client/server market leadership in the process.

For now, the NonStop Himalaya Range is essentially Tandem's flagship for this client/server-based direction, and the company will use it to broaden its open systems strategy.



## 7. Overall Assessment

Tandem, like so many established vendors, is a victim of the fierce competition and price cutting that continues in the computer hardware market. In its third fiscal quarter of 1993, Tandem announced a net income loss of \$550 million, the company's largest quarterly loss ever; and as noted above, the company plans to lay off a substantial number of employees by the end of calendar 1993. In order to improve its financial performance and gain a competitive edge, the company has begun reorganizing internally, resulting in layoffs, and focused its product and service strategy on client/server computing.

The NonStop Himalaya Range is the embodiment of Tandem's client/server focus and is fundamentally an intelligent path for the company to follow. Unfortunately, the company is in the difficult position of not just wanting these computers to gain acceptance, but needing them to gain acceptance. The Himalaya Range has been devised as a way for Tandem to improve the uninspiring financial performance it has delivered the last several years. Jim Treybig has aggressively asserted that the Himalaya Range will eventually generate 80% of Tandem's sales. This indicates a high degree of confidence in these products and a high level of dependence upon them.

To achieve its financial objectives, Tandem must find a new, more robust source of revenue than its existing proprietary customer base. The Himalaya Range may offer the company a source for new customers. In this situation, Tandem must quickly demonstrate the viability of its new products and use marketing expertise to position them to the greatest possible advantage for the company and its customers. Tandem has demon-

strated that it has the vision and the strategy to be profitable and progressive; now the company must show it has the products, marketing skill, and agility to reach its goals.

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# CLIENT / SERVER MARKETS & APPLICATIONS PROGRAM

INPUT®

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## COMPANY PROFILE: Sequent Computer Systems, Inc.

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SEQUENT

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The following profile outlines the products, services and support offered by Sequent Computer Systems, Inc. to their clients for the implementation of client/server and other distributed or downsized computing strategies.

### 1. Description of Principal Business

Since its founding in September, 1983, Sequent Computer Systems, Inc. (Sequent) has been both a pioneer and a leading maker of symmetric multiprocessing (SMP) computer server platforms. The company was the first to develop and, in 1984, sell SMP systems that were linearly scalable, thereby allowing from two to 30 processors to share memory within the same machine while increasing computing performance.

During the course of developing SMP machines, Sequent has also been a leader, with its numerous alliance partners, in developing SMP-based software systems, including DYNIX/ptx, the company's multiprocessor-enhanced version of UNIX. The company also recently expanded its SMP architecture to include Microsoft

Corporation's Windows NT. Sequent also supports SMP-based relational database management systems (RDBMS) and on-line transaction processing (OLTP) technologies developed in conjunction with database vendors such as Oracle Corporation, Sybase, Inc., Ingres Corporation and Informix Corporation.

Since the company shipped its first SMP systems, it has directly installed nearly 5,000 large-scale systems worldwide. Sequent users are members of virtually every industrial sector and include British Petroleum, Ford Motor Company, Korea Telecom, Nedlloyd Lines, Oracle, Thrifty Drug, UniHealth America and USAir.

Many of the company's contracts in recent years have focused less on Sequent as a product vendor, but more on the company's growing expertise and

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Exhibit 1

**Overall Financial Performance  
Sequent Computer Systems, Inc.**

	1992 Revenues (\$Thousands)	1991 Revenues (\$Thousands)	1990 Revenues (\$Thousands)
Product Revenue	252,093	178,280	227,956
Services/Other Revenue	55,181	34,992	20,825
Costs and Expenses*	286,724	263,364	224,178
Income (Loss) before Taxes	15,884	(52,379)	26,155
Provision (Benefit) for Taxes	1,451	(3,718)	7,312
Net Income (Loss)	14,433	(48,661)	18,843

\*In fiscal 1991, Sequent took \$22.2 million in pre-tax restructuring charges

acceptance as a systems and solutions vendor. This reflects a conscious strategic change the company implemented fully in 1992, largely based upon the emergence and growth of client/server technologies and the realization that distributed and open systems in the client/server framework require more overall systems expertise for integration of disparate computing elements. Currently, Sequent's services and latest platform offerings are aimed directly at the client/server market.

These products and services are discussed in more detail in Section 4, Client/Server Products and Services. Exhibit 1 provides an overview of Sequent's overall financial performance for the last three years.

## 2. Strategy for Supporting Client/Server Requirements

Sequent uses the term "rightsizing" to describe its fundamental strategy for client/server implementation. As a company that has made a concerted

effort to develop with an open systems philosophy, Sequent helps customers rightsize by moving centralized mainframe-based, proprietary applications to distributed, client/server-based systems.

As noted above, Sequent has changed its fundamental focus from product vendor to systems and solutions vendor. According to Mike Demshki, Sequent's Marketing Manager for Client/Server Computing, the company's goal is "to provide a complete system to large enterprises, with hardware, software and professional services." Sequent's professional services group, for example, has training and experience on multitudes of hardware and software platforms other than those produced by Sequent. "Because client/server is applicable to all of our company business, (Sequent is) positioned to do the whole job, acting as a systems integration vendor in conjunction with our partners," Demshki said.

Pursuant to this, Sequent adheres to the following strategies:

- **Commitment to Open Systems**—As mentioned above, Sequent's rightsizing strategy focuses on open systems, and the company's products and solutions incorporate as much industry standard technology as possible. These include Intel Pentium microprocessors, UNIX, Windows NT, Oracle, Sybase and other open RDBMS systems.
- **Strategic Relationships with Leading Suppliers**—Sequent allocates substantial resources to strategic marketing and product development agreements with companies it believes supply the best open systems technologies. These include companies such as Forté Software, Informix, Isocor, Microsoft, Novell, Oracle, ParcPlace, Progress Software, Servio, Sybase and Unify Corporation.
- **Designing Complete Computing Solutions**—This is perhaps the company's most important strategy. Sequent deems crucial the need to understand the particular systems needs of its customers, and provide them with value-added computing solutions which integrate hardware, system software, networks, communications, applications software and deployment services. Sequent uses the term "CIO-centric" to describe its solutions strategy, for within the realm of technology the company has identified the CIO as the key strategist. Sequent's goal is to essentially help the CIO help his own company use technology more efficiently and cost-effectively in the service of the customer's business needs.

The company also focuses on department-level systems design and implementation; however, strategically Sequent believes it can provide benefit and value by focusing on the CIO and the overall business process re-engineering needs of

the customer at the enterprise level. Therefore, the company is increasingly focused on large organizations with divisional operations and centralized legacy computing environments. Sequent's goal is to help these customers move from proprietary systems to enterprise-wide client/server systems.

### **3. Scope of Current Client/Server-Related Activities**

Sequent sells its products primarily to end users through a globally-distributed sales organization. In addition, the company also uses value-added resellers (VARs), original equipment manufacturers (OEMs), a Japanese joint venture and foreign distributors to sell its products. Currently, Sequent has 49 sales offices throughout the world, including 31 in North America.

As a result of shifting its corporate focus from selling point products to providing systems and solutions, the company experienced significant turnover among its sales executives. The ultimate result was an increase in Sequent's sales executives from 124 at the end of 1991 to 153 by the end of 1992. Most of these increases occurred in the U.S., Canada, Europe, Hong Kong, New Zealand and Australia. Sequent also added distributors in Greece, Singapore, Mexico and South Korea. In 1990, 1991 and 1992 respectively, international sales comprised 31%, 46% and 49% of the company's total revenues. Currently, Sequent has sold more than 5,000 systems to over 1,400 end user customers. None of these customers accounted for more than 10% of the company's total revenues for 1990, 1991 or 1992.

As noted earlier, Sequent has strategic relationships with numerous vendors. The following companies are currently allied with Sequent in different capacities:



- In late June 1993, Oracle Corporation and Sequent announced the availability of Oracle Parallel Server, which is designed to run on Sequent's ptx/CLUSTERS. During testing, this system established a benchmark, supporting more than 10,000 users and delivering more than 1,000 transactions per second at a cost of less than \$10,000 per transaction.
- Microsoft Corporation is a close partner of Sequent. Currently, all models of Sequent's WinServer product line come with the preinstalled and preconfigured Windows NT Advanced Server operating system. Sequent is also a partner of Microsoft's Solutions Channel program, under which the two companies' sales forces collaborate on potential contracts and sales. In addition, the service engineers for both companies provide support to customers utilizing Sequent systems running Microsoft products.
- SAP AG and Sequent announced in October 1993 that the two companies will make SAP's R/3 applications software available on Sequent WinServer systems. Sequent will be one of the first vendors to make SAP's software package available on systems running Windows NT. The two companies expect the ported version of R/3 to be available commercially by the second quarter of 1994.
- In November, 1992, Forté Software, Inc. announced a strategic partnership with Sequent. Forté is currently beta testing a client/server applications development product which will allow developers to design and create enterprise-wide applications for truly heterogeneous client/server systems. Both companies share engineering and marketing activities in support of the Forté product running on Sequent's Symmetry systems.

- Pioneer Standard Electronics, Inc., and its affiliate, Pioneer Technologies, Inc., are VARs for Sequent WinServer client/server platforms. Under terms of the agreement, Pioneer will purchase and resell WinServer systems, while Sequent will provide training, technical and sales support under its reseller channel program. Pioneer is part of Sequent's 20-member WinServer VAR Channel program.
- Unisys Corporation is currently Sequent's primary OEM. Under the terms of an agreement made in January 1989, Sequent provides systems to Unisys, which integrates software and peripherals for sale to its own customers. Unisys has no manufacturing rights under the agreement, which comes up for renewal in January 1994. In 1992, Unisys generated 12% of Sequent's total revenues, although the company expects this figure to decrease for 1993.
- Pana-Sequent is a joint venture company formed by Sequent and Matsushita Electric Industrial Co., Ltd., the Japanese electronics giant. Pana-Sequent enhances, distributes and supports Sequent computer systems in Japan.

#### 4. Client/Server Products and Services

In May 1993, Sequent announced not only its latest generation of hardware platforms, but also a high level of commitment to Microsoft's Windows NT operating system. The embodiment of this, the WinServer Family of systems, is a scalable, SMP-based database and application server line which has been developed specifically for the Windows environment. The systems have been designed to fully utilize NT's SMP support functionality. All models in this product line are shipped with the Windows NT Advanced Server operating system, and are upgradable to the Intel Pentium microprocessor. The WinServer line includes:



- **The WinServer 500** - an entry-level Windows NT Advanced Server platform designed for use in NT development projects. The 500 can support up to two 486 Pentium processors, 384 MB memory, and 1.8 GB of disk storage. Pricing begins at \$13,297 for a 500 configured with a single processor and 128 MB of memory.
- **The WinServer 1000** - aimed at workgroups and small departments needing client/server-based, business-critical applications access and support over local area networks (LANs). Priced at \$29,900, the 1000 offers two Pentium processors, 512 MB memory, up to nine 3.5-inch disks and two SCSI channels.
- **The WinServer 1500** - likewise aimed at LAN-based workgroup computing. However, it offers 21 disks and four SCSI channels. In addition, the 1500 can also come equipped with fault-tolerant data storage for protection and high availability, as well as optional redundant power supplies and cooling fans. Pricing for this platform starts at \$39,300.
- **The WinServer 3000** - a high-end database and application server incorporating up to six 66 MHz Pentium processors, 512 MB memory, 96 disks and 16 SCSI channels. The 3000 also has an integrated configuration management, diagnostic and performance analysis system with data collection facilities resident on each of the major subsystems. Priced at \$75,900, the 3000 also offers fault-tolerant data protection facilities and redundant power supplies and cooling fans.
- **The WinServer 5000** - the largest of the line and is aimed at mainframe-class computing needs while maintaining a high level of PC-based software compatibility. Sequent's top-of-the-line platform offers 30 Pentium 60 MHz processors, 192 disks, 1.5 GB memory and 32 SCSI channels. The 5000 also offers parallel-

processing communications facilities for very high bandwidth to support enterprise-level LAN computing environments. Pricing for this platform starts at \$336,000.

- **WinCentral Direct** - Sequent's professional services/systems integration offering to customers who purchase products from the WinServer Family. Through WinCentral Direct, Sequent provides customers with access to technical consultants who aid in custom configurations for all components in their particular computing system, including hardware, operating system software, databases, networking and applications software. In order to increase the speed with which customers can implement a given system, WinCentral Direct can also work with them to determine their specific needs; and then configure the WinServer system prior to shipping. When the system is delivered, Sequent ensures that the disparate components within it operate in an integrated fashion so that it is "work ready," allowing the customer to use it immediately after installation. As customer system requirements change or increase, WinCentral Direct provides both telephone and on-site support to assist in any additions or reconfigurations that are necessary.

The professional services Sequent typically provides include enterprise-wide system analysis and design, network analysis and design, project management, on-site implementation assistance, customer training, system administration and disaster recovery.

In addition to the Windows-based WinServer Family, Sequent offers the Symmetry 2000 Series of scalable, UNIX-based SMP computer platforms. Currently, all Symmetry systems are Pentium-based and include:

- **The Symmetry 2000/290** - the entry-level system in this group. The 290 provides support for up to several hundred users and incorporates from two to six Pentium processors, from 64 MB to 320 MB memory and from 2.1 GB to 109 GB disk storage. The 290 is priced from \$85,500.
- **The Symmetry 2000/490** - targeted at the mid-range user for departmental and corporate computing needs. It offers from two to ten Pentium processors, up to 768 MB memory and up to 403 GB disk storage. Designed to support as many as 500 users, the 490 is priced from \$155,000.
- **Sequent's Symmetry 2000/790** - for corporate data center environments. This system can utilize up to 30 Pentium processors; 1.5 GB memory and 806 GB disk storage capacity. The 790 can support over 1,000 users and is priced from \$336,000.
- The company's **Symmetry 2000/990 Clusters** come in three different configurations. Each configuration is comprised of two 290s, two 490s or two 790s. Sequent clusters are available to customers needing centralized data management for their client/server systems. 990 systems offer software for automatic failover, systems analysis and performance tuning, high-volume data management, batch queuing and clusterwide load balancing. In addition, Sequent provides packages which allow customers with unclustered Symmetry platforms to convert their machines to a clustered configuration as computing needs grow. An entry-level 2000/990 system is made up of two 2000/290 systems and is priced from \$271,900. A cluster with two 2000/490 systems is priced at roughly \$725,000.
- **DYNIX/ptx** - Sequent's POSIX-compliant version of the UNIX operating system, and it is the standard systems software for the Symme-

try product line. DYNIX/ptx is X/Open XPG3-branded and complies with the System V Interface Definition validated under AT&T's System V Validation Suite; IEEE POSIX 1003.1-1990 Portable Operating Systems Interface standard; Federal Information Processing Standard 151; the X/Open Portability Guide, XPG-3 Level 1 interface standards; ANSI C; and Intel's i386/486 Binary Compatibility Standard (BCS).

To support the Symmetry line, Sequent offers services analogous to those provided by WinCentral Direct.

## 5. Recent Client/Server Engagements/Contracts

The following five brief case studies illustrate Sequent's recent client/server customer activity:

- **Thrifty Drug, Inc.** - In October 1993, this company awarded Sequent a contract to provide a large client/server decision support system aimed at reducing response time for sales and distribution queries. Under the contract, Sequent provided Thrifty with professional consulting services for system design, integration and training, in addition to a Symmetry 2000/750 platform. Other components of the system include Lightship, a query tool from Pilot Software Co. that runs under Windows and interfaces with an Oracle 7 database. When the system is fully implemented, Thrifty executives and managers will be able to receive query responses more quickly by accessing the company's database, which contains sales information from 500 retail stores and several mail order operations.
- **National Association of Securities Dealers (NASD)** - Announced in September, 1993 this is a five-year contract whereby Sequent will

provide NASD with client/server systems and professional services for corporate operations.

During the first year of the contract, Sequent will provide NASD with consulting and education services related to the installation of two clustered Symmetry 2000/750 systems that will provide high availability for more than 1,000 users. With Sequent's assistance, NASD's goal is to expand and improve the services it can offer to members, affiliates and listed companies of the NASDAQ stock market.

- **AT&T - E9-1-1** is AT&T's enhanced emergency calling service that routes emergency calls to positions known as Public Safety Answering Points (PSAPs). After receiving a call, a PSAP automatically captures the caller's address and related data from either a local or remote Automatic Location Identification (ALI) database.

Due to the increased need for higher-transaction processing speeds and more storage capacity, AT&T developed the E9-1-1 Database Management System, which is capable of providing critical data to dispatchers in cities with customer bases ranging from 500,000 to 30 million users. The system consists of a Sequent Symmetry 2000 system running Informix relational database management software and AT&T custom software. AT&T chose Sequent after rigorous testing that indicated that Symmetry systems had the reliability and the speed to manage a mission-critical, fault-resistant RDBMS. The Sequent-based system supports up to 30 million possible callers and multiple ALI retrieval systems to supply E9-1-1 operators with easily accessed, current information.

- **Teleflex Information Systems, Inc.** - In order to more accurately issue monthly bills and protect itself against delinquent customers, this company devised FLEXCELL, a billing and

reporting system designed to streamline its cellular telephone subscription business.

Developed on the Oracle Cooperative Server product, FLEXCELL resides on a Sequent Symmetry 2000 platform, which provides the application the parallel and scalable technology Teleflex requires to run its billing system smoothly and cost effectively.

- **Kenny Standard and Poor's** - In 1991, this company reassessed its technology strategy in order to continue competing in a rapidly changing market. S&P decided that a distributed, client/server model with enterprise-wide networks and data access would increase individual responsiveness. A centrally controlled database would ensure easily accessible, incorruptible data with which to do business.

S&P enlisted the aid of Sequent to provide the hardware and the integration experience necessary to create a client/server system. Currently, the company competes using Symmetry 2000 platforms, NetWare for Sequent Information Servers and Oracle RDBMS software to supply its employees and agents with current, accurate trading information.

## 6. Future Plans

According to Marketing Manager Mike Demshki, Sequent's ultimate goal is to combine DYNIX/ptx and Windows NT. "We are very committed to NT, and this is based upon what we perceive to be our customers' needs," said Demshki, adding that ideally NT would act as a department-level server system linked to UNIX, which would act as an enterprise-level server system.

"Users want desktop applications to integrate with enterprise applications. The more (Sequent) can work toward making computing truly operating system-independent, the more strategically secure we will be," said Demshki. The company believes that other vendors will ultimately

become NT-based, and that by leading a UNIX-NT integration Sequent will be the first to find an operating environment that wins both the desktop and the enterprise environment. According to Michael Simon, Sequent's Senior Vice President of Business Development, the company's thinking is based upon its assessment that Windows has already won the desktop, and that its descendant NT will become the next standard in the enterprise evolution. "When we realized what NT was, we decided NT would win as an enterprise product," Simon said.

Accordingly, Sequent is shipping NT on its WinServer family and continues to explore the avenues which will bring UNIX and NT together. In the process, Demshki said, Sequent continues to develop and refine its products, and to seek further partnerships and alliances which will further the company's expertise and market position. "We don't want to be known as a UNIX or NT company. We expect to build architected solutions comprised of appropriate open and legacy technologies using both UNIX and NT," said Demshki, adding that Sequent's emphasis will be on enterprise architectures, which demonstrate interoperability and coexistence between operating systems, rather than platforms.

### 7. Overall Assessment

By seeking to combine NT in the workgroup and UNIX in the data center, Sequent is positioning itself to extend its reach throughout the enterprise. UNIX itself is a tried-and-true operating system with which Sequent has had good success. NT, however, is still rather embryonic in terms of how it performs, how it can be used, and how it will be accepted. To Sequent's credit, the company has shown that it can shrewdly and success-

fully predict information technology trends and position itself to take advantage of them. Perhaps the company can become the SMP-based UNIX/NT leader.

Operating systems aside, Sequent has a sound and thoughtful approach to the marketplace. Its self-described CIO-centric strategy is sensible, as the CIO, or equivalent, is likely to become the fundamental focus for many vendors seeking to provide solutions at the enterprise level where contracts tend to be larger. It will be interesting to see how a company traditionally known for its hardware and integration skills will do after spending more time implementing its all-encompassing, macroeconomic approach to re-engineering business.

This profile is issued as part of INPUT's Client/Server Markets and Applications Program. If you have questions or comments on this profile, please call your local INPUT organization or Angela Hey at INPUT, 1881 Landings Drive, Mountain View, CA 94043-0848, (415) 961-3300.